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Table of Contents

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Page.

The Pagan Races of the Malay Peninsula, by *H. N. Ridley* 1

On Tally Sticks and Strings in Borneo, by *Dr. Hose and J. Hewitt* 7

New or Rare Malayan Plants, Series III, by *H. N. Ridley* 11

A Journey into the Interior of Borneo to Visit the Kalabit Tribes, by *R. S. Douglas*... 53

Notes on the Capture of a Rare Leathery Turtle in Johore Waters, by *C. Boden Kloss* 63

Malayan Pigs, by *C. Boden Kloss* 67

Mantra Gajah, by *W. George Maxwell* 71

Malay Chess, by *J. B. Elcum* 87

Note on the Malay Game "Jongkak," by *M. Hellier* ... 93

Concerning Some Old Sanskrit, by *Professor H. Kern* ... 95

Miscellaneous Notes, by *George W. Maxwell* 103

Notes and Queries, by *W. G. M.* 108

Bark Canoes among the Jakuns and Dyaks, by *Dr. W. L. Abbott* 109

Tin and Lead Coins from Brunei, by *Dr. R. Hanitsch* ... 111

The Pagan Races of the Malay Peninsula.

By W. W. Skeat and O. Blagden.

(A Review). By H. N. Ridley.

As the work of civilization progresses and the forests fall before the axe of the planter, the more primitive tribes of jungle folk disappear, to be replaced by the imported and more civilized labourer from other countries; and should these old world folk themselves not actually disappear, they amalgamate with the later arrivals, and adopting their ideas and customs, they become so changed that all that is interesting about them is lost. Many tribes of the human race have thus passed away, leaving few or no relics of their ever having existed. One such race, indeed the makers and users of the stone implements known here as Batu Lintar, has vanished from the peninsula; but we have still with us that simple people commonly known as S'akais, whose manners, customs, traditions and language, have been long the study of Messrs. Skeat and Blagden, who together have published a most excellent record of the vanishing tribes of the jungle folk of the Malay Peninsula. The work in two volumes excellently illustrated by photographs and woodcuts is perhaps one of the most important of ethnological works that has appeared for some time. No trouble has been spared by the authors, both well known officials here some years ago, to collect all possible evidence on all ethnological and anthropological questions concerning these races, and the extensive list of the Bibliography of the subject shows how thorough their work has been.

The Bibliography dates from 1800, or thereabouts, and is divided up into three periods. The first two from 1800 to 1850, and thence to 1890, though giving a good many amateur's notes and some amount of research work, supplied little more than enough knowledge to stimulate research into these interesting races. The only representations of any of the tribes in those days were the rough sketches of profiles by Miklucho Maclay which were to be found in all ethnological books. Indeed till about 1890 photographs of these races were quite unprocurable in Singapore. From 1890 onwards the wild men were the subject of study by a large number of ethnologists and antropologists. Several scientific men came from Germany, and many local residents investigated the ethnology and collected specimens of their handiwork, made researches into their language, and took photographs of the people themselves, besides securing skulls and skeletons. The results of this work in which Mr. Skeat took a very large share himself, are well represented in these two volumes. One of those who devoted a great deal of time to the wild tribes was Mr. Vaughan Stevens, a very well known character here for some years, who was employed by the Berlin and St. Petersburg Missions to collect ethnographical specimens of the Sakais, and who wandered about all over the peninsula in search of them. He published voluminous accounts of his researches, on some of which considerable doubt has been thrown. The authors have made use of his work while drawing attention to inaccuracies and improbabilities in his observations and theories. The most important of the anthropologists who visited the peninsula was Herr Rudolf Martin whose monumental work "Die Inland stamme der Malayischin Halbinsel" was the first sound and reliable work on the subject.

The book commences with an introductory account of the environment of the wild man, and his character and relations to it.

The racial characters and names of the tribes and the problems of their origin are next dealt with. The three types of the tribes are the *Semangs*, negritos with woolly hairs and brachycephalic heads, the *Sakais*, dolichocephalic with wavy hair, and the southern *Jakuns*, brachycephalic and smooth haired. The relationship of the Semangs with the Andamanese and the Philippine negritos is certainly close. The Sakais are perhaps related to the Veddahs, Australians and Tamils. They vary much in skin-colour and height, and their origin must remain at present doubtful. The Jakuns have been stated to be aboriginal Malays who refused to accept Mohammedanism and therefore fled to the interior to avoid persecution. The author points out however that they are rather a composite group of heathen Malays mixed with Semang and Sakai, and this is probably the case.

The methods of hunting, trapping and fishing, the weapons, cultivation, food, arts and crafts, social order, dealings with other races fill the first volume, which terminates with an appendix containing much important matter in measurements, color of hair, eyes, and skin and a large collection of Sakai songs chiefly collected by Mr. Skeat. Many of these are hunting songs describing the chase and capture of about all the jungle animals. Most songs end with a request to give each of the community a portion of the prey. This is a true characteristic touch of the socialism of the Sakai community. I remember once being out with some of the wild tribe of the Kuala Lumpur district near the well known caves. In the party were two men and one delightful little boy of about nine years of age clad as most of the men were in the simple costume of a strip of trap bark about as broad as a bootlace, and an armlet of fungus. While at tea we offered the child some bread and jam which he took eagerly and ran off at once to divide it with his father. When given a cigar he would not take it till he had another one for his father, showing the innate socialistic tendency of the race.

But to return to the songs after this digression. One is struck at first sight by the graphic descriptions of the habits of the animals, their appearance and cries. Some of the songs and charms too have an element of poetic feeling running through them.

In many cases the language of the Besisi from whom the author has derived most of the songs and charms is a mixture of Malay and Sakai words, the meaning of some of the latter being obscure. Mr. Skeat has translated them as literally and carefully as may be, though perhaps it might have been better not to have called the Kijang, the Roedeer, or if no other translation was to be found, to have explained what the animal really was, but its common name of Muntjac is fairly well known. Here and there in the songs and charms we see words and names of places of quite modern origin, such as Tanjong Pagar, Singapore, Telasih, (the Hindu Tulsi) for the Basil plant known to Malay as Selasih, and this has been commented on by one reviewer as somewhat discrediting the songs, but such innovations in folk song occur in many nations, having drifted in later perhaps than the original song was written.

A long list of names of people is given, many of which are not translated but among them are such poetic ones as Blossom, Convolvulus, Earth, Wind, Star, Butterfly, and Father of Leaf for boys, and White, Quick, Mother of Grass, Little One and Handmaid for girls.

The second volume opens with accounts of customs and beliefs. The Semangs acknowledge two deities, Kari and Ple but there seems to be no cult of these gods who are rather shadowy beings. The Sakais have a similar deity who however was probably of Malay or Arabic origin. There are however numerous demons and spirits, which are feared and have to be kept off by charms, as in all races of the world. The creation legends seem to be mainly original. In Semang and Jakun mythology man multiplied so fast, being immortal, that the earth was overcrowded, and Kari according to the Semangs slew them with his fiery breath, while according to the Jakuns, Tuan dibawah their deity turned half of them into trees. But this check on the population being insufficient death was instituted as a relief. The Jakuns appear to have anticipated the discovery of evolution in ascribing the origin of mankind to a pair of white apes, which is curious, especially in view of the fact that the ape specified, the wawa (*Hylobates*) is generally considered the most nearly related to man of any of the apes. The charms, ceremonies, traditional sales, dances, and such subjects are fully dealt with, and the last part of the book deals with the language, the special task of Mr. Blagden, than whom it would be difficult to find a better authority. A vocabulary of the dialects is given at the end.

The amount of research which this work must have entailed has been extremely large, and the authors have spared no pains to get together everything that has been recorded in the various journals and works on the subject of these strange races, besides adding extensively from their own observations. They have collected too a very fine series of photographs of the different races, and added many of the weapons, houses, dress, traps, and other objects, so that the whole work gives a very full and graphic view of one of the most interesting and least known of the peoples of the earth. When one looks back for a comparatively few years ago in ethnological and anthropological works to see what was known about this people, and sees what poor and often inaccurate accounts we then had, and find the only existing portraits of any of the races were Miklucho Maclay's rough sketches, one can appreciate the value of this work, and the immense labour of the authors in compiling it, and they are heartily to be congratulated on the results.

As they very pertinently point out in the introduction to the work there is great need of a thorough survey of the whole Peninsula from both a geographical and ethnological point of view by the local Governments. The Governments of French Indo-china, the Dutch Indies and the American Philippines have published and are still publishing excellent works, beautifully illustrated, on the ethnology, geography, and all branches of science of the colonies under their control. The British nation with larger, richer and more important colonies, for some reason not very clear to anyone, has practically done nothing at all for the advancement of knowledge of its vast empire. The whole of this work has been left to enthusiastic private persons who devote their time and money to such work. This apathy must be much regretted by all who have the cause of science and progress at heart.

On Tally Sticks and Strings in Borneo.

By Dr. Hose and J. Hewitt.

Amongst the natives of Sarawak, notched sticks and strings are in common use for keeping record of contracts. To some of the various tribes the custom is one of antiquity whilst in other cases *e.g.* the Sea Dayaks, it is certainly a new idea borrowed from their neighbours.

If a Malanau undertakes to meet another person in a definite number of days he ties up a piece of string into as many knots as there are days before the fulfilment of his engagement: as each day passes by he unties a knot. The same people often appear in the debt courts carrying a knotted string or rotan and explaining that each knot represents a debt of one pasu of lemanta (8 gallons of raw sago). On one occasion a Malanau produced in the debt court a stick notched on two sides : on the one side the notches corresponded to his debt, and on the other side he had cut a notch each time he had made a repayment.

Amongst the Kenyahs, Punans and other tribes of the interior this custom reaches its highest development. The string is made from bark of the tree known to Kenyahs as Kumut and to Sea Dayaks as Tekalong (*Artocarpus sp.*) As before, it is knotted according to the number of days before that of the engagement, and each party keeps a string. They wear it on their person tied to the unus, slender leglets of twisted fibre usually from the ijok palm (*Arenga saccharifera*). As each day passes by a knot is cut clean off. To such people a definite contract thus arranged is kept quite seriously and the evidence of his tally string is usually deemed quite sufficient to relieve the wearer of other conflicting duties which might be imposed upon him by the head-man of the house.

But this custom is by no means confined to men. Even Bali Atap, a god of the Kenyahs, wears such knotted strings around his neck to tell off the number of doors in the house

Jour. Straits Branch R. A. Soc., No. 49, 1907.

under his care, and also to indicate the number of people under his protection in each house. The image of Bali Atap outside the door of a Madang house has a whole fringe of knotted strings tied round his neck. This deity (Bali—a hero, Atap—a spear) is the special protector of the house, and when they want him to take charge of a house it is necessary to kill at his altar a fowl or pig, the blood of the sacrifice being sprinkled over the head of the wooden image of the god and on those persons of the assembled crowd, who wish for his protection; in some cases however an egg in a cleft stick has to suffice as the offering. To the Kenyah or Punan the tying of the knot for Bali Atap has a deep significance: it means to them the sealing of a fixed contract. They will only tie such knots whey they receive an omen from Bali Atap sufficiently favourable to justify them in assuming that the god is willing to make the agreement with them. The actual manner of obtaining such an omen is as follows: a man fixes up two vertical poles in the ground and on the top of these and again two feet below he attaches horizontal poles; then he sits down behind the square thus formed and looks through it to the area of sky beyond. At this part of the ceremony the above mentioned sacrifice is made. And now, after waiting perhaps for hours, if a hawk soars in this patch of sky in a direction from right to left, he knows that this hawk will carry his message to Bali Atap, and seeing it he waves a fire brand in the air towards the flying bird at the same time loudly shouting the message which is carried upwards in the ascending smoke to the hawk. Thus being assured that Bali Atap has been willing to receive and hence is favourable to his request he completes the ceremony by tying the knotted string to the image of the god as a seal to the agreement just made between Bali Atap and the man.

The same idea in the tying of a knot is met with in entirely different ceremonies of which we may mention one example. It is held by Kenyahs that when a person falls sick his soul leaves the body and to heal the patient all that is necessary is the return of the soul. The witch doctor (Dayong) in charge of the case obtains assistance from the next world and thus is able to persuade the erring soul to return. In the ceremony the Dayong affects the motions of a person going a long journey—paddling a boat for instance—chanting all the time and accompanied in the chorus by the people who repeat over and over again the words 'Bali Dayong;' then returning with the soul he with the assistance of a fowl or pig waives it back into the body. And now, when safely in and the fees paid, the Dayong knots round the patients wrist with a string of 'Daun silat' (leaf of a Licuala palm) and thus ties in the soul and at the same time completes the undertaking. During this time however the soul of the Dayong has been absent from his body and at this stage to the cries of 'Mulai Mulai' (Come home, come home) from the crowd it re-enters, the man himself suddenly relapsing from a quivering hissing maniac into a rational being who, as if just awakening from a sleep, takes his seat unconcernedly amongst the crowd.

Tally sticks also are very much used by Kenyahs, Punans, and other inland tribes (but not Kayans) who have not come in contact with more civilised peoples. An ordinary Kenyah tally stick is a strip of wood about a foot long, an inch or more wide, and an eighth of an inch thick: at one end is a rudely carved head and hands, a representation of the god. At one side of the stick are marks each referring to one door of the house. A debt incurred by the occupant of any 'door' is recorded by a notch in the corresponding position on the stick. Bartering among these people is very limited: their objects of barter are few, being mainly pigs, fowls, parangs, gongs, and pieces of iron. For each of these different objects there are separate positions on the stick. Excepting in rare cases debts are not incurred between occupants of different houses so that one stick of the type just described is as a rule quite sufficient to record all the debts owed to one man. When a debt is paid the owner of the stick will just snip away the wood from either side of the notch so as to replace the notch by a curved depression in the wood.

The tally stick is usually to be found hung up near the fireplace where it becomes smoked and blackened with age: such a stick would be accepted as evidence in case of a dispute respecting a debt of long standing, for it would not be easy to forge an old notch. A stick which has been kept for years acquires quite a high value as a 'lucky' stick: it is customary also in disputes to swear with such sticks calling down vengeance on themselves if they tell a lie. Kenyahs, whose conservatism is not very strong, often content themselves with sticks devoid of carving or polish and even sometime without the image of the god.

In conclusion therefore it seems to us very probable that in the knotted string (terbuku tali) of the more civilised and better known natives of Borneo and perhaps in the tally stick we have something which did not originate merely as a means of counting but which is a relic that has largely lost its original meaning of covenant.

New or Rare Malayan Plants.

Series III.

By H. N. Ridley.

This is another series of novelties and notes on little known plants from the East. The recently published numbers of the Materials for the Flora of the Malay Peninsula by Dr. King contains the *Scrophularineæ*, and I find in the genus *Torenia* one common species altogether omitted and two very distinct plants wrongly identified with two common Siamese plants cultivated here only. I have therefore given descriptions of these three plants. Some new plants obtained in Sarawak by Mr. Hewitt, some from Southern Siam by Mr. Down, and other little known or new plants from elsewhere are described.

Neckia.

The small genus *Neckia* comprises a few species of small half shrubby plants belonging to the section *Sauvagesiaceæ*, of *Violaceæ*. They are usually under a foot tall, often only a few inches high, with lanceolate toothed leaves, and small rose or white flowers. The slender woody stem seldom or never branches and is more or less covered with bristly hairs. The fruit is a small capsule containing a large number of very small reticulate seeds.

The Neckias are to be found on rocks, usually sandstone or granitic, in the forests of the Malay Peninsula, Sumatra and Borneo.

N. Malayana, n. sp.

Whole plant 3-12 inches tall. Stem naked below (from the falling off of the leaves), woody slender, above covered densely with the bristle-like stipules red brown ¼ inch long. Leaves alternate lanceolate acuminate at both ends, margins biserrate but obscurely, glabrous dark green above glaucescent or pale beneath 1½ to 7 inches long, nerves very numerous inconspicuous. Flowers axillary on long slender peduncles 1 inch long. Bract linear minute, pedicel ¼ inch long. Sepals 5 lanceolate acute toothed. Petals 5 rose pink ovate obtuse. Stamens monadelphous 10. Pistil conic, style straight longer than the stamens, capitate. Capsule ovoid acute with the style persistent longer than the sepals, seed obovoid punctate dark brown.

Johor: Gunong Janeng (Lake and Kelsall), Telepak (C. B. Kloss), Gunong Panti (Ridley 4164); Pahang: Tahan river (Ridley 2264), Lingga, edge of a stream at 200-300 feet (Hullett).

There are two forms of this, one small to 1 foot tall, the leaves broadly lanceolate 2½ inches long by ½ inch wide and more strongly toothed. This is the form common in Johor and Lingga. The Pahang plant has leaves 6 inches long and ¾ inch wide, and might be made a variety under the name of *angustifolia*.

N. distans, n. sp.

Stem slender woody over a foot tall, internodes ¼ inch long. Leaves alternate stipules of dark brown branched hairs, persistent shorter than in the preceding. Leaves lanceolate acuminate narrowed gradually at the base, margins bidenticulate, 5 inches long ¾ inch wide, scattered over the stem and not persistent only at the top. Flowers solitary axillary, peduncle very short less than ⅛ inch. Bract lanceolate acute minute, pedicel ½ an inch long or very much less. Sepals broadly lanceolate acute striate ⅛ inch long with a few teeth towards the tip. Petals shorter ovate, lanceolate blunt pink. Stamens shorter than in the preceding. Style shorter than the petals. Capsule ovoid shorter than the sepals.

British North Borneo: Bongaya in Labuk Bay (Ridley 9054).

Neckia serrata, Boerlage. Ic. Bogor XXVI. may possibly be this species.

N. lancifolia, Hook. fil. Trans. Linn. Soc. XXIII. p. 158.

The whole plant about 6 inches tall. Stem woody, internodes short; stipules of long erect bristly brown hairs. Leaves crowded towards the tip broadly oblanceolate obtuse, base narrowed acuminate, edges stringly bidenticulate dark above rather coriaceous, pale beneath 4 inches long by 1 inch broad or less. Flowers solitary axillary on peduncles ½ inch long, pedicels shorter. Sepals ovate lanceolate, not or little toothed ribbed, longer than the capsule. Petals very small ovate. Capsule subglobose shorter than the sepals.

Borneo: Sarawak on Matang (Hullett, Ridley).

Miquel, and Boerlage and Koorders (Ic. Bogor lxxvi) identify Hooker's plant collected by Lobb in North Borneo, with Korthals' plant *N. serrata* which is described as four feet tall and is a native of Sumatra. I never saw any species of Neckia nearly as big as this. The plant figured in the Icones Bogorienses as *N. serrata* seems to be different again. It can hardly be Hooker's plants, for in his description the leaves are said to be bidenticulate whereas in the plant figured they are almost quite entire, remarkably so for one of the genus. Hooker's plant is probably the one described above, but his description is too short for so critical a genus. It can hardly be either Korthals' plant or Bœrlage's.

N. Klossii, n. sp.

Stem 4 or 5 inches tall woody leaves crowded upwards. Stipules ferrugineous. Leaves oblanceolate, subacute, narrowed towards the base glabrous dark green above light green beneath edges bidenticulate especially towards the tip 2½ inches long ¾ inch wide. Scapes very slender several together or solitary ½ inch long. Bract linear very narrow. Sepals lanceolate acuminate very narrow, acute, with a few rather large irregular teeth on the edge green. Petals oblong obtuse much broader and a little shorter white. Staminodes very numerous bright yellow, linear clubbed. Stamens pale spathulate. Style a little longer; fruit not seen.

Pulau Battam (C. B. Kloss, March 1906).

Nearly allied to *N. parviflora* Ridl. but with extremely narrow sepals and oblong petals nearly as long and much broader.

N. parviflora, n. sp.

Stem decumbent rooting 6-8 inches long woody, nude below, stipules dark red. Leaves lanceolate shortly acuminate blunt, narrowed a little at the base toward the short petiole somewhat coriaceous bidenticulate 3 inches long ½ inch wide. Flowers very small on slender peduncles with several bracts. Peduncles 2 or 3 in each axil in a tuft ½ inch long with three linear entire bracts. Pedicel of flower very short. Flower sepals ⅛ inch long ovate crenulate at the edge enlarging to ovate denticulate in fruit nearly ¼ inch long and ribbed. Petals much smaller lanceolate ovate, anthers oblong ovate. Capsule much shorter than the sepals ovoid oblong. Seeds reticulate.

Sarawak: Banks at Puak (Ridley 12320.)

Distinct in its small flowers, and numerous peduncles, with several bracts, linear in the flowering stage but becoming larger lanceolate dentate in the fruiting stage. The largest bracts I have seen in the genus.

N. humilis, Hook fil. Trans. Linn, Soc. XXIII, p. 158. Labuan. (Lobb.)

N. serrata, Korth Ned. Kruidk. Arch. I. p. 358 Miq. Fl. Ind. Bat. I. 2 p. 118. This is described as four feet tall, a native of Sumatra.

I have never seen anything fitting the descriptions of either of these two species.

GLUTA.

There are a number of trees belonging to the *Anacardiaceæ* commonly known to the Malays as Rengas, and all are well known for their poisonous properties. This poison lies in a black resin which is abundant in all parts of the trees, chiefly in the wood and fruit. Several of these Rengas trees belong to the genus *Melanorrhoa* characterised by its small fruit furnished with bright crimson wings, others belong to the genus *Gluta* in which the fruit is a larger or smaller drupe with often a corky brown exterior full of black resin.

There are about ten known species of *Gluta* occuring in Cambodia, Andamans, Tavoy, the Malay Peninsula and Islands.

Nearly all these Rengas trees possess a very fine red timber marked usually with black streaks of the resin and have been known as Singapore mahogany. When used as furniture wood however they are said to exhale a certain quantity of the poison probably in the form of dust which is very injurious to those using the furniture. An article on poisoning by Renghas (*Melanorrhea*) was published by Dr. Brown in Journal 24, 83, (1892). Cases of poisoning among jungle folk by these plants are by no means rare, a drop of the juice from a broken bough even of a seedling falling on the face or body often producing serious effects. The resin is also said to be used as a poison with criminal intent producing violent irritation of the stomach and intestines.

It is interesting to note that though the Mangiperas (Mangos) are closely allied to the *Gluta* and contain to a lesser extent the same black resin, their timber is more or less of a yellow colour, while that of the Melanorheas and Glutas is red.

There are four species of *Gluta* known from the Malay peninsula, one of which however has not been described, and I have received specimens of fruit and flowers of this fine timber tree from Mr. Burn-Murdoch.

Gluta Benghas, Miq.

A medium sized tree usually much branched low down. Leaves elliptic or obovate coriaceous with a fairly long petiole, and glabrous panicles of white flowers. The fruit brown, corky outside, with much black resin. This tree has only been met with by myself in the Malay Peninsula on the banks of the Pahang river and on the Rumpin river. It occurs also in Sumatra, Java and Borneo, and a variety is recorded from Madagascar.

G. elegans, Kurz.

Is a smaller tree slender and tall, with rather long narrow elliptic leaves rather long petioled, and bright red calyces to the flowers. The fruit is flattened and rounded 1½ inch across smooth and black. It occurs commonly in Penang, and has been met with in Malacca and a variety occurs in Tenasserim and the Andamans. Native Name "Rengas Ayam."

G. coarctata, Hook fil.

This I take to be the extremely common bush or bushy tree occurring in most tidal waters in this region. It never seems to attain any great size and is conspicuous in the water edge of the river from its bright red young leaves. The flowers are yellowish white in panicles shorter than the leaves. The fruit is subglobose, corky, light brown and very resinous.

This is the commonest species; very abundant in all our tidal rivers, and also very conspicuous in Sumatra and Sarawak.

Gl. Wrayi, King.

I have seen no type of this but I take the description given in the Materials of the Flora of the Malay Peninsula to apply to this plant, of which good specimens were sent to me by Mr. Burn-Murdoch, under the name of Rengas Kerbau Jalang or Red Rengas. It is a very big tree with stiff coriaceous leaves 4 to 6 inches long elliptic acute narrowed at the base to a broad flat petiole, nerves about 12 pairs conspicuous on the lower surface, finely reticulated on both sides. Panicles 4 inches long with rather distant branches to near the base; flowers very numerous red and white

Panicle and flowers pubescent. Calyx half as long as the corolla bilobed pubescent lobes rounded. Petals linear oblong obtuse, back pubescent. Stamens slightly longer, filaments slender glabrous. Ovary rounded ovoid pubescent style lateral shorter than the stamens. Fruit oblong red brown, a large hard drupe of a laterite red colour 4 or 5 inches long and 3 inches thick elliptic smooth slightly oblique. Dindings: at Lumat (Ridley 7974); Perak (Wray 2290); Penang: Telok Bahang (Curtis).

"Rengas Kerbau Jalang" This gives a very fine timber known as Red Rengas according to Burn-Murdoch. There is a plant in the Botanic gardens raised from seed brought from the Dindings in 1894 which is now about 8 feet tall. The leaves are much larger in the young plant, some being 8 inches long and of a bright green. Compared with Sir George King's description this plant only differs in the leaves not being thickly coriaceous, though rather stiff when dry, and the nerves are quite visible on both surfaces and prominent on the underside, the petiole too is not channelled but distinctly flat, but there is some variation in the foliage.

Gl. lanceolata, n. sp.

A big tree. Leaves narrowly lanceolate obtuse narrowed into a long slender petiole, coriaceous blade 6 inches long, 2 inches wide, nerves rather inconspicuous about 12-14 hairs, reticulations conspicuous, petiole 1½ to 3 inches long. Panicles 4 inches long much resembling those of *Gl. Wrayi* pubescent. Calyx half the length of the corolla, tubular split on one side, pubescent. Petals linear oblong obtuse 5 back pubescent tip tufted with hairs, and a band of hairs down the centre of the inner face. Stamens considerable longer than the petals, filaments very slender. Ovary sub-globose quite glabrous, style lateral rather long. Fruit unripe globose glabrous black.

Penang: Balek Pulau (Ridley 9465).

This differs from *Wrayi* in the less pubescent spathaceous not bilobed calyx, the pubescence on the inner face of the corolla lobes and the perfectly glabrous ovary. A specimen collected by Curtis in Penang of what seems to be the same plant has elliptic acuminate leaves very much resembling those of *Gl. Wrayi* but the flowers are exactly those of the above described species.

COMPOSITAE.

In the 16th part of the Materials for a Flora of the Malay Peninsula Sir George King publishes the account of the Compositæ of the peninsula. Most of the plants of this order here are introduced species often of wide distribution, but a considerable number have apparently not been seen by him, although they are thoroughly established in the country. They are

Sparganophorus Vaillantii Gaertn.

So common as to be a pest in the gardens. A herb with axillary balls of purple flowers, growing in damp spots. Common in Tanglin and elsewhere. I have also found it in Selangor at Batu Tiga and in Borneo at Lundu in Sarawak district. It is said to be a native of the West Indies.

Elephantopus tornentosus L.

This is a very much taller plant than the common *E. scaber* four or five feet tall and much more woolly The stems are much branched and the leafy shoots tall and very woolly. It has a very different appearance from the common plant and is said to be a native of North America.

Johor, Roadside Castle wood, Tebrau river (Ridley).

Conyza semipinnatifida, Wall.

A very common weed in new clearings and waste ground. A tall branched plant with small heads of yellowish flowers, quite resembling *Erigeron linifolia* in appearance. Clarke says in his description of it in the

Compositae Indicae that its flowers are "intense flava," but it is a very dull thing here. I have it from Pulau Ubin, Bukit Mandai (Ridley 3807); Johor: Batu Pahat (Hullett); Pahang: Pulau Jellam, Pahang river, Sungei Ujong, Burunang (Cantley's coll); Selangor: Kwala Lumpur (Curtis); Penang Hill (Ridley 10205); Selangor Caves (Ridley 8235). A big plant 6 feet tall. Malacca: Bukit Asahan (R. 12586), and Perak in Cantley's Collection.

Its Native names are "Sumbong Jantan" and "Sari bulan."

A specimen collected by Dr. Keith in Bangtaphan is also in the Botanic Gardens Herbarium.

These three species were identified at Kew.

Xanthium strumarium.

Occurs as a weed in Singapore Town.

Caesulia axillaris, Roxb.

What appears to be this plant occurs in Singapore at Galang (7085 of my collection), and at Dato Kramat in Penang (Curtis 3455). It is known as Chinkro and Kangkong Kerbau in Penang and is used as a salad by Malays and as medicine by Chinese.

Acanthospermum xanthioides, Dec.

A prostrate herb with white flowers and spiny fruit, occurs in Singapore on road sides, Macpherson Road (8417, 6241), Ang Mokio (2740), of my collection and was also collected by Hullett on Drew's road in 1884.

Blumea spectabilis, Dec.

A tall weedy plant growing in woods. Selangor: Ginting Bidai (Ridley 72 16); Kwala Lumpur (Curtis 2350); Sungei Ujong (Cantley's Coll.). I have it also from Siam at Bangtaphan collected by Keith and from Christmas Island. It is recorded from India and Ceylon. The plant known as Chapur and Kupugis is boiled and applied in cases of Rheumatism.

Bl. densiflora, Dec.

I take a stout plant like *Bl. Balsamifera* but not aromatic which grows on the road up the Taiping hills to be this plant. It is abundant on the road side at 4000 feet alt.

Vernonia eleagnifolia.

Is also omitted from the Flora. It is a sarmentose shrub with lavender flowers. I met with it in Pahang at Pekan on the riverbank near Ayer Hitam in flower in June (Ridley 1199). Plants brought to the Botanic Gardens grow into bushes but have never flowered since. I have it also from Bangtaphan in Siam collected by Dr. Keith.

CYRTANDRACEÆ.

Chirita rupestris, Ridl.

Since publishing the account of this plant in the Journal, I have obtained and raised plants of this species from a seedling which came up in a pot in Penang Gardens, and am able to add fuller details to my account of it, which was based on somewhat weak plants collected by Curtis in the Lankawi islands in 1889.

The plants now raised are more robust, the stems stouter, more or less purplish and sometimes much branched. The leaves are light green as are the urn-shaped involucres of two bracts. The flowers described as dark blue in Curtis field-note are light violet blue with a white tube and yellow throat, ¾ inch long, the limb half an inch across, the corolla lobes are rounded and glabrous in front, but the tube margins of the lobes, and mouth of the tube are covered with white hairs. The two stamens have short thick sinuous filaments, and elliptic anthers. The ovary is cylindric and hairy the style not much longer. The stigma is flat and linear.

Cyrtandromaea minor, n. sp.

Whole plant 20 inches tall, stem angled pubescent. Leaves opposite ovate lanceolate obtuse, base acute margin crenulate 2½ inch long 1¼ inch wide, scabrid hairy on both surfaces, petiole ¼ inch long hairy. Flowers in axillary umbels, peduncle ¾ inch long hairy. Bracts lanceolate acute white hairy. Flowers 5 in an umbel, pedicels ⅙ inch long white hairy. Calyx ¼ inch long campanulate pubescent, lobes 5 acute red. Corolla ½ inch long tubular lobes rounded, pubescent firm texture, white or yellow. Stamens 4 didynamous. Style shorter than the two longer stamens stout, stigma broad subquadrate. Ovary small quadrate truncate surrounded by a sinuate disc.

Sarawak: Kuching (Hewitt).

Cyrtandra Gimlettii, n. sp.

Stem woody brown, 4 inches tall pubescent, especially the young parts. Leaves obovate subacute narrowed gradually to the base serrate, bright green reticulate bullate, main nerves 6 pairs, shining above, with appressed scattered hairs, nerves beneath thickly hairy 6 inches long four inches wide, petiole beneath purple. Flowers in small tufts from the lower leaves or from axils of fallen leaves, 4 or 5 together sessile. Bracts small ovate pale whitish yellow hairy. Calyx short tubular deeply bilobed with two acute points hairy. Corolla tube ½ inch long thick curved dilated upwards hairy, limb ½ inch across upper lobes subtriangular obtuse lower three oblong obtuse, glabrous in front, creamy white, lower lip yellower, with deep purple blotching ending in two purple bars on the lower lip. Stamens 2, filaments stout sinuous purple, anthers orange elliptic pressed together. Pollen floury white. Stigma transversely oblong large green. Staminodes 2 very short sinuous filaments, from near the base of the tube.

Kelantan: Kwala Lebir (Dr. Gimlette).

This little plant was sent alive by Dr. Gimlette from Kelantan and flowered in the Botanic Gardens in December 1906. The stamens project first after the flower opens, and shed the pollen on the lip. The second day the filaments contract and curl up and the stigma appears at the mouth of the flower.

Didymocarpus (§ *Bæopsis*).

I propose this section of *Didymocarpus* for a number of small species with the short corolla-tube and two short stamens with thick sigmoid filaments and subglobose or elliptic anthers. The form of the flowers and habit of the plants is exactly like that of *Saintpaulia*, an African genus, and that genus only differs in the thick conic capsule. It would probably be better to separate the section above mentioned into a distinct genus, *Baeopsis*, but there are intermediate links with the long tubed *I. idymocarpi*. The section would include. *D. perdita* Ridl., *D. puncticulata* Ridl., *D. heterophylla* Ridl., and the following new species from the island Pulau Battam, south of Singapore.

D. battamensis, n. sp.

Leaves elliptic obovate 2 to 3 inches long 1½ inch wide, apex and base rounded minutely bullate, deep green more or less softly hairy with a grey green central bar, edges crenate, beneath purple covered with pink hairs, nerves elevated reticulate; petiole ½-2 inches long pink hairy. Scapes numerous slender purple 3 to 4 inches long pubescent one-flowered. Calyx 5 lobed, lobes lanceolate acute purple. Corolla tube short campanulate white ⅛ inch long, limb ½ inch across very unequal, lobes rounded pubescent outside upper lobes 2 pale violet, lower larger deep violet with three darker nerves on each lobe, tube inside white with a bright orange spot on each side. Stamens 2, anthers elliptic yellowish white large parallel. Filaments broadly linear short and recurved at the tip. Style cylindric purple at the base, tip yellow. Stigma capitate. Capsule an inch long sausage shaped, terminated by the style.

Pulau Battam, an island south of Singapore (C. B. Kloss), Sept. 1905.

This species is certainly closely allied to *D. perdita* Ridl. but is much more hairy with shorter petioles, and stem and more slender fruit. It is a very pretty little plant but I have failed to cultivate it.

SCROPHULARINEAE.

Torenia mucronulata, Benth. Dec. Prodr. X. 410.

A prostrate creeping herb a foot or more long, with slender branched hairy stems. Leaves ovate crenate narrowed at the base tip rounded sprinkled with hairs above, the nerves on both surfaces more densely hairy ½ inch wide and as long, petiole hairy ¼ inch. Flowers axillary solitary or in pairs nearly sessile. Calyx lobes ovate reticulate hairy. Corolla small white with a pale blue bar on each lower petal.

On paths Singapore, Garden jungle, Bukit Timah (Ridley 6894), Galang; Dindings, Gunong Tungul (Ridley 9444); Pahang: Pahang river Ridley); Penang: Waterfall and Government Hill (Curtis 1837); Tringanu, Bundi (Rostado).

Native Names K'ra Nasi; Gelumak Susu, Rumput Labang.

The powdered leaves are applied in cases of snake bite or rheumatism.

Hooker in Flora Brit. Ind. seems to think this but little distinct from *T. polygonoides* but in life at least it is extremely different in its hairiness, and quite differently coloured flowers. It always dries black which *T. polygonoides* does not.

Torenia caelestis, n. sp. A slender creeping plant, the stem and leaves pubescent hairy. Leaves ovate dentate subacute base broad 1 inch long petiole ¼ inch long. Flowers solitary terminal on slender peduncles 1½ inch long. Calyx bilobed not winged hairy ½ inch long, lobes lanceolate subacute, ribbed in fruit. Corolla ¾ inch long, Lobes oblong rounded, light blue.

Johore: Kota Tinggi and along the road to Gunong Pantai (Ridley 4169).

This plant was identified in the Materials for the Flora of the Malay Peninsula as the very different *T. Benthamiana*, a Cochin Chinese plant commonly cultivated under the name of *T. Bailloni.* This plant has large yellow flowers with a brown centre, while *T. caelestis* has much smaller flowers of a light blue.

Torenia atropurpurea, n. sp.

Stems creeping and rooting slender 2 feet long or more, branched internodes 1 to 4 inches long. Leaves ovate to deltoid glabrous minutely pustular above, apex acute base broad or slightly cuneate margin crenate serrate, 1-2 inches long ½-1 inch wide, petiole slender ½ inch long. Flowers solitary in the upper axils on slender 1 inch peduncles. Bracts very small linear. Calyx ⅜ inch long narrow tubular, lobes linear acute free for ⅔ of the length of calyx. Corolla deep violet purple an inch long tube narrow tubiform mouth ½ inch across lobes rounded. Capsule oblong ½ inch long abtuse shorter than the calyx. Seeds subquadrate.

Perak: Maxwell's Hill (Ridley 5507), Bujong Malacca (at the first Waterfall Ridley 9756) without locality (Scortechini 2122); Selangor: 15th mile, Pahang track (Ridley 8533). On claybanks often growing in great clumps.

This charming plant has somehow been mistaken in the Flora of British India for *T. asiatica*, a native of Siam commonly cultivated in the East and occasionally appearing is an escape from cultivation. It differs from this species in being a creeping perennial, instead of an erect annual, in its narrow linear calyx lobes and long narrow-tubed deep purple corolla. It is a very pretty plant well worthy of cultivation but I have failed to succeed in establishing it.

Microcarpæa muscosa, R. Br.

A small herb forming large tufts of a bright green colour under water in shallow spots. Stems one to 4 inches tall succulent glabrous, leaves $\frac{1}{10}$ to long opposite oblong blunt. Flowers axillary solitary sessile very small. Calyx tubular five toothed, teeth acute erect, at length spreading pubescent. Corolla tube cylindric shorter pale, limb hardly projecting beyond the calyx, violet 5-lobed, four short acute, one longer linear oblong all fringed with white hairs. Stamens fertile 2 included, anthers 1-celled yellow, no staminodes. Style shorter than the calyx with a curved lateral stigma. Capsule much shorter than the calyx tube oblong ovoid dehiscing into two valves. Seeds oblong elliptic ocreous rugose.

Singapore: on the edge and shallow water of the Reservoir. September 1906.

This curious little plant has not previously been recorded from the Malay peninsula, but is known from India, Java and Australia, Griffith, (Notulæ Asiaticæ IV. 101. Ic. Pl. As. t. 417. f. 2). describes a species as *M. diandra* from Bengal which Hooker in the Flora of British India is doubtful about because Griffith says that the calyx is 5-fid, Griffith's rough sketch of the structure of the flower is however very good as far as it goes, showing the curious corolla lobes, one of which is linear oblong and much longer than the others which are small and nearly equal, a point overlooked in all descriptions of the plant, and further he shows the curious processes which terminate and fringe the lobes of the corolla, nor is he altogether wrong about the calyx being deeply cleft. The sepals are indeed connate to near the tip where the five lobes are free and in fruit spread out starwise, but they are so slightly connate that they very readily separate with but little force used, and in one flower I found them quite free. In fruit they seem to be more firmly attached. The corolla in this plant is very much reduced, and the limb really almost rudimentary, suggesting that its usually submerged life has caused the limb so conspicuous in the *Limnophilas* to be useless and reduced to a rudiment still retaining however traces of the violet coloring (especially conspicuous in the bud) so characteristic of the Limnophilas. The little plant forms bright green masses in shallow water, and when submerged is usually very short little over an inch tall; here owing to the drying up of the water edge it is quite free of the water it becomes taller and is three or four inches tall.

BIGNONIACEÆ.

Tecoma Curtisii, n. sp.

A slender climber with wiry stems, internodes 8 inches long. Leaves opposite 4 inches, petiole 1 inch, leaflets 5 lanceolate acuminate base rounded entire glabrous light green shining 1¼ inch long by ⅝ inch wide, petiolule ⅛ inch long. Cymes axillary and terminal on short peduncles. Flowers numerous crowded pedicels ⅛ inch long. Bracts shorter linear subulate. Calyx cupular ¼ inch long greenish purple with 5 short subulate processes. Corolla 2 inches long, base cylindric enlarging funnel-shaped upwards to the mouth, one inch across; lobes subequal oblong rounded, base of tube and interior yellow, outside pinkish yellow lobes pinkish white. Stamens 4 included, anthers white bases divergent, apex terminated by a violet subulate process. Style longer. Stigma lanceolate flat white.
Fruit unknown.

Penang: Batu Feringhi (Curtis);

This has long been cultivated in the Botanic Gardens at Singapore, but it has never set fruit and I have never seen fruit on wild plants. It seems to be local in Penang, growing over trees to no great height at Batu Feringhi. It flowers nearly all the year round. Mr. Sprague of Kew proposes to call this *Nyctocalos Curtisii* as the plant is hardly a typical *Tecoma*. It is however so utterly different from any other species of this genus, that it will perhaps be preferable to retain it in the genus *Tecoma* till we can obtain fruit of it.

ORCHIDEÆ.

Microstylis aurata, n. sp.

Stem an inch long hardly bulbous. Leaves 6-9 erect narrow lanceolate acuminate, inacquilateral narrow at base into a petiole winged to the base 6 inches long 1 wide or narrower. Scapes 1 or 2, slender 6 inches lengthening with flowering to one foot, base (about 4 inches) nude except for a few linear bracts $\frac{1}{4}$ inch long, 4 angled. Floral bracts lanceolate acuminate longer than the pedicels. Flowers very numerous opening one or two at a time about 50 sepals ovate, laterals rather broader than upper one $\frac{1}{8}$ inch long three nerved blunt. Petals narrower linear one nerved blunt. Lip auricles very large recurved red, ovate lanceolate acute, as large as the rest of the lip, limb obovate narrower at the base and enlarged into two rounded oblanceolate lobes, elevated veins at the base between the auricles column short with very short arms. Capsule elliptic oblong $\frac{1}{4}$ inch long.

Sarawak: Quop. Fls. yellow, lateral lobes of lip red, (J. Hewitt).

Siparis Downii, n. sp.

Stem about 1½ inch long. Leaves few elliptic lanceolate herbaceous 3 inches long $\frac{3}{4}$ inch across slightly narrowed to the base acute at the tip. Peduncle slender terete 4 inches long. Bracts linear acuminate $\frac{1}{8}$ inch long deflexed. Flowers 5, small, ovary and pedicel

$\frac{1}{4}$ inch long. Dorsal sepal oblong linear, pale fuscous purple, laterals oblong decurved inacquilateral green with indistinct purple breaks along the outer edge than the lip. Petals linear narrow purple $\frac{1}{8}$ inch long. Lip fleshy shining, base broad parallel to the column. Apex oblong obovate decurved emaginate with very obscure teeth on the outer edges dull green at base passing into purple at the tip, calli 2 conic at the bend in the lip green between them and for some way on the blade a deep purple groove. Column acuate green wings short rounded base dilated. Anther green skull shaped.

Southern Siam. Coll. St. V. B. Down, flowered in H. B. Singapore June 1905.

Bulbophyllum longerepens, n. sp.

Rhizome very long slender emitting tufts of roots from below the pseudobulbs. Pseudobulbs 1 inch apart oblong $\frac{1}{2}$ inch long angled. Leaf elliptic apex rounded $1\frac{1}{4}$ inch long by $\frac{1}{2}$ inch across, petiole $\frac{1}{8}$ inch long scapes from the internodes very short hardly $\frac{1}{4}$ inch, with ovate amplexicaul bracts. Floral bracts ovate acuminate longer than the pedicel. Flowers very small $\frac{1}{8}$ inch long about 5 or 6 on a scape, glabrous sepals lanceolate condate. Petals about half as long oblong subacute. Lip shorter than the petals narrowly linear oblong with two slightly raised veins running the whole length. Column stout stelidia tooth-like acute erect longer than the anther.

Sarawak, Santubong (Hewitt), off 18. Java Tremb.

Dendrobium sulphuratum, n. sp.

Rhizome creeping $\frac{1}{4}$ inch through. Stems swollen slightly 2 inches long covered with close sheaths. Leaves 2 oblong coriaceous acute, 3 inches long 1 inch wide glabrous. Raceme subterminal with one lateral branch 2 inches long. Bracts ovate or lanceolate acuminate $\frac{1}{8}$ inch long. Flowers rather thick in texture.

Pedicels 1 inch long ovary elongate angled. Sepals lanceolate acuminate $\frac{3}{4}$ inch long. Petals narrower sulphur yellow. Lip shorter $\frac{1}{2}$ inch long base rather narrow, lateral wings short round distinct, midlobe fleshy lanceolate acuminate acute reddish brown.

Sarawak: Sajingkat (Hewitt). Feb. 10, 1906. This belongs to the *Sestochilus* section and is allied to *D. Treacherianum.* I have not seen the old bulbs.

Dendrobium (*Sestochilus*) *radicosus,* n. sp.

Rhizome very long slender with numerable wiry roots, pseudobulbs elliptic oblong $\frac{1}{4}$ inch long and as far apart. Older ones larger conic $\frac{1}{2}$ inch long. Leaves 2 to each pseudobulb elliptic coriaceous subacute narrowed at the base $\frac{1}{2}$-$\frac{3}{4}$ inch long $\frac{3}{8}$ inch across. Flowers solitary terminal, pedicel slender $\frac{1}{2}$ inch upper sepal lanceolate hardly $\frac{1}{2}$ inch long acute laterals slightly broader. Petals narrower shorter oblong obtuse. Mentum short and rounded. Lip as long as sepals, three lobed base narrowed, lateral lobes broad oblong triangular truncate. Midlobe longer elliptic with 2 thickened papillose ridges at the tip, a number of small papillae on the nerves of the base of the side lobes. Column rather long.

Sarawak: Tiang Lagu (J. Hewitt): "Petals dull pale yellow with a rosy tinge. Lip yellow with red brown spots."

Coelogyne exalata, n. sp.

Epiphytic, pseudobulbs crowded subglobose rounded. Leaf solitary lanceolate petioled coriaceous 6-12 inches long by 3 inches wide acuminate at the base tip mucronulate, petiole 4 inches. Raceme lateral erect, bearing 6 or 7 flowers, 8 inches long. Bracts convolute $\frac{1}{2}$ inch long brownish green. Pedicel as long. Sepals 1 inch long $\frac{1}{4}$ inch wide. Upper one spathulate lanceolate acute laterals oblong acute green tinted brown or light brown, spreading petals shorter spathulate lanceolate acute green, appressed.

Lip spathulate entire, sides at base convolute, tip acute 1 inch long with three distinct nerves and no crests, green. Column white ½ as long as lip dilated upwards top flattened, apex broad clubshaped truncate Clinaudrium elevated entire, anther deeply sunk, wings incurved. Pollinia 4 in 2 pairs each pair on a distinct lanceolate disc, yellow pyriform, anther 2 celled skull-shaped beaked beak bifid, rostellum lobes large 2 upcurved oblong rounded.

Sarawak : on Serapi, the top of Matang end of August 1905 (Ridley 12470). This singular plant differs from any species of *Caelogyne* in having a perfectly entire lip with no side lobes.

Platyclinis minor, n. sp.

Pseudobulbs oblong void, crowded (yellow and much wrinkled when dry) ⅜ inch long. Leaf linear lanceolate blunt narrowed at the base into a petiole, 3 inches long ¼ inch wide, petiole very slender 1 inch long. Peduncle 2-3 inches long very slender flowers crowded in a raceme 1-3 inches long. Bracts papyraceous persistent ovate acute ⅛ inch long ribbed. Pedicels slightly longer than the bracts. Flowers ¼ inch across. Sepals lanceolate acuminate acute, 3 nerved, central nerve thickest. Petals shorter broader oblong slightly dilated upwards rounded obtuse strongly 1 nerved. Lip pandurate base broad oblong short side lobes small rounded inconspicuous, midlobe elliptic obtuse 3 ribbed. Column narrowed at the base with large triangular wings acuminate, rising from near the top and projecting above the column, wings of clinandrium triangular. Anther ovate.

Sarawak Santubong (J. Hewitt).

Platyclinis minima, Pseudobulbs very crowded conic obtuse ¼ inch long. Leaf elliptic slightly narrowed towards the rounded tip shortly petioled 1 inch long $\frac{3}{8}$ inch wide. Raceme very slender 2 inches long rising from the axil of a broad lanceolate papery sheath. Flowers about 14, distant bracts oblong obtuse papery persistent $\frac{1}{8}$ inch long. Pedicel half as long. Sepals lanceolate acute long. Petals half as long elliptic obtuse lip clawed oblong entire dilate towards the tip rounded. Column have narrow dilated above with lanceolate acuminate arms rising a little below the stigma.

Sarawak: Tiang Layu. (J. Hewitt).

Eria (Trichotosia) aurea, n. sp.

Stems rather slender erect 18 inches or more tall nearly glabrous except for a line of red hairs on the side opposite the leaf and a circle of red hairs at the mouth, (young parts sprinkled with short red pubescence). Leaves, lanceolate light green acute with a broad base rather fleshy glabrous. Racemes 1 inch long few flowered red hairy. Bract at the base cup-shaped covered with red hairs. Bracts lanceolate obtuse red hairy. Flowers small about 6. $\frac{1}{8}$ inch long, enclusive of ovary. Upper sepal lanceolate acute red hairy laterals ovate fulcate acuminate red hairy, mentum scrotiform. Petals linear falcate obtuse. Capsule elliptic $\frac{1}{4}$ inch long.

Sarawak Santubong (Hewitt).

Flowers golden yellow with reddish brown hairs. The specimens were nearly past flower.

Eria (acridostachyae) triloba, n. sp.

Stem apparently cylindric 3 inches long. Leaves lorate or linear-lorate obtuse 14 inches long by one inch wide, subherbaceous. Scapes a foot long, raceme dense all coverd with brown wool. Bracts lanceolate $\frac{1}{8}$ inch long brown woolly, peduncles nearly $\frac{1}{4}$ inch long. Sepals upper lanceolate obtuse, laterals subtriangular, mentum short thick rounded. Petals very thin narrowly linear. Lip three lobed shorter than sepals, base long linear very narrow, side lobes triangular lanceate recurved acuminate, midlobe nearly as long as the claw lanceolate obtuse fleshy pustulate, all strongly nerved the main nerve elevated on the disc. Column dilated upwards rostellum projecting.

Sarawak Santubong (J. Hewitt).

This resembles *Aeridostachya* Rchb. f. but has a very different lip.

Pholidota grandis, n. sp.

Pseudobulbs several crowded elliptic or conical 2-3 inches long, angled and ribbed. Leaves 2 to each pseudobulb oblong oblanceolate long petioled, acute, blade 12 inches long narrowed into the 13 inch petiole, ribbed. Raceme erect 8 inches or more from the base of a pseudobulb, peduncle half the length nude dull green spotted red. Raceme dense many flowered. Bracts caducous elliptic subobtuse, ½ inch long, as long as the flowers, ovary and pedicel spreading green. Sepals ovate obtuse apple green. Petals smaller oblong white recurved. Lip base rounded saccate edge elevated undulate side lobes, broad irregularly oblong rounded, bifid on the outer edge white. Column short, hood very broad truncate retuse narrowed downwards green. Anther orange semiorbicular, trigibbous two celled stigma cordate.

Selangor Semangko Pass. Il in H.B.Singapore Aug. 1905.

This fine Pholidota was collected by me with *Caelogyne Dayana* on trees in the Semangkok Pass. In habit it quite resembles a Caelogyne. The flower spike with its dense white flowers is quite attractive.

Tainia borneensis, n. sp.

Rhizome creeping covered with broken upsheaths. Leaf ovate acuminate 6 inches long 2-2¼ wide. Glabrous petiole 1 inch long stem a foot long from the axil of a leaf pubescent with three or four lanceolate bracts scattered about. Flowers 2 to 6, crowded at the top, pedicel woolly, 1/4 inch long, bract lanceolate acuminate glabrous. Upper sepal lanceolate acuminate, laterals broader, forming a short blunt mentum at the base 1/4 inch long. Petals narrower, linear acuminate. Lip shorter obcuneate, base oblong dilated towards the end into a broad truncate limb with two short side lobes and one small oblong median one. Column rather long curved, stelidia short, anther lanceolate. Pollinia ovoid flattened.

Sarawak : Mt. Lingga (Hewitt).

Plocoglottis borneensis, n. sp.

Pseudobulbs several, terete thickened slightly towards the base and purplish 2 inches long. Leaf solitary, broadly lanceolate, 8 inches long, 4 inches wide, plicate tapering to the winged petiole, seven-nerved dark green. Peduncle 12-16 inches tall pubescent arising from above the base of the pseudobulb. Bracts small ovate acuminate.

Flowers several. Upper sepal largest 1/2 inch long lanceolate, long acuminate-yellow base red spotted, laterals similar but narrower at the base, backs pubescent. Petals similar but glabrous. Lip less than 1/4 inch long, quadrate, tip broad equally shortly trifid pale yellow. Column about as long yellow with two broad flat wings white with red edges and descending bar, a violet streak below, widened at the base. Anther cap thick dark yellow blunt with a strong ridge running to the tip. Pollinia 4 in two pairs in narrow cells of the anther, elliptic one slightly above the other, pedicel linear-pulverulent, discs oblong yellow rather large. Margin of clinandrium elevate subovate. Stigma large ovate.

Common in Sarawak especially at Lundu, and Tambusan, terrestrial in damp woods. Also at Bidi.

This plant I took at first for Reichenbach's *Plocoglottis Lowii* (Xenia Orchidacea Vol. II p. 142. pl. 154). But even allowing for very rough drawing this can hardly be intended for the common Sarawak species. The flowers of this exactly resemble those of *P. moluccana* Bl. but that is figured and described as belonging to the group of many leaved *Plocoglottis.* No one seems to have seen *Plocoglottis Lowii* since it was first introduced. It is described as having yellow and brown flowers as large as those of *cattleya luteola.* By some extraordinary error Hallier has identified it with a plant which from his figure and description I take to be *Pl. porphyrophylla* Ridl. and J. J. Smith has followed this determination in his orchids of Amboina. No two species of the genus are more utterly dissimilar. *Pl. porphyrophylla* with its dull purplish flowers half an inch across, and most peculiar lower sepals cannot possibly be the plant Reichenbach intended, with flowers 2 inches across, bright yellow with the lower sepals quite resembling the upper one.

The following are the species of the genus known. Some from Borneo.

Species with single leave to each pseudobulb.

Pl. Lowii, Rchlf. Locality unknown said to be Bornean.

Pl. borneensis, Ridl. Sarawak.

Pl. porphyrophylla, Ridl. *(Pl. Lowii* Hallier not Reichenbach) recorded from Borneo by Hallier.

Pl. parviflora, Ridl.

Species with leafy stems.

Pl. dilatata, Bl. Sarawak, Mt. Kowa. Braang (Haviland 76) on limestone rocks.

Pl. parviflora.

Leaves lanceolate acuminate 2 glabrous thin 5 nerved narrowed to a long petiole 12-16 inches long 1½ inch wide. Scape lateral from the rhizome, rather stout 2 feet long, scurfy pubescent, flowers distant few, small.

Pedicel and ovary ½ inch long. Closely scurfily pubescent. Sepals narrow linear oblong cuspidate $\frac{3}{10}$ inch long. Petals subspathulate narrower. Lip base oblong, limb broader ovate oblong cuspidate, with two short linear ridges on the limb. Column tall, anther cordate in outline, top fleshy retuse.

Sarawak: Mt. Lingga (Hewitt).

Allied to *Pl. Porphyrophylla*, Ridl. but the flowers are much smaller and the lip of a different shape.

Saccolabium aureum, n. sp.

Stem about 2 inches long. Leaves crowded lorate 3 inches long little more than ¼ inch wide thick, apex very unequally bilobed, tops rounded. Racemes 1 inch long dense flowered. Bracts lanceolate acuminate ¼ the length of the pedicel and ovary. Flowers ¼ inch long pale greenish yellow or golden yellow, spur white. Upper sepal ovate acute, laterals ovate oblong mucronulate. Petals as long oblong obtuse narrower. Lip ovate rather longer than the sepals, sides elevated rounded (lateral lobes) terminal lobe narrower half the length of the hypochil, linear oblong, ending in a fleshy rounded callus spur as long as the lip nearly as long as the pedicel stout cylindric obtuse upcurved. Column very short with two much longer erect horns acute. Anther skull-shaped with a very large oblong truncate beak. Pollinia 2 globose small on an oblong linear pedicel with a much larger oblong truncate disc bearing a short process beyond the point where the pedicel adheres.

Sarawak: Kuching (J. Hewitt).

This curious species is most nearly allied to *S. secundiflorum*, Ridley.

S. brachystachys, n. sp.

Stem short, 4 inches long very thick. Leaves lorate coriaceous, thick 8 inches long, 1½ inch wide, deep green, apex bluntly unequally lobed. Panicles short 3 branched, branches 1 inch long many flowered. Bracts very short ovate acute. Sepals oblong obtuse ⅛ inch long. Petals shorter narrower linear, all yellow with a central reddish bar. Lip, side lobes large oblong ending in a cusp, midlobe ovate obtuse violet, spur short rounded scrotiform white, a broad oblong fleshy bar over the mouth of the spur, and a short conic boss in the centre of the lip between the side lobes. Column thick, wings incurved white, anther broad long-beaked. Pollinia elliptic curved, on a long linear pedicel with a small disc.

Sarawak : Tambusan, fl. H. B. S. 1905.

This plant is not rarely brought from Sarawak by native collectors.

S. validum.

Roots copious thick corky, stem stout 4 inches long ½ inch through. Leaves coriaceous lorate 6 inches long ¾ inch through unequally bilobed. Panicles from lower axils 9 inches long slender, peduncle 3 inches long, branches 2, upper one longest. Flowers numerous but remote. Bracts ovate acute small. Pedicels ¼ inch long. Sepals lanceolate subacute. Petals much smaller, dull yellow, with reddish purple blotching in centre. Lip shorter, spur nearly as long as the ovary straight cylindric blunt, side lobes short oblong rhomboid blunt, midlode longer, short ovate fleshy callus in mouth of spur fleshy quadrate large decurved. No septum in spur or callus. Column short, anther 4 celled ovate. Pollinia transversly bilobed, pedicel oblong linear, disc oblong truncate column wings short incurved. Rostellum arms horizontal oblong truncate with a minute process at the upper edge.

Perak : Kamuning (Machado) July 10, 1905.

Certainly allied to *S. pallidus.*

S. fissicors, n. sp.

Stem 4 or 5 inches long. Leaves linear oblong rounded emarginate at the lip 4-5 inches long 1 inch across rather thickly coriaceous. Raceme 10 inches long very slender, peduncle 6 inches long purple. Bracts very small ovate. Flowers rather distant small. Rachis faintly black scurfy. Occasionally one branch near the base. Pedicel and ovary $\frac{1}{5}$ inch long bright yellow green. Sepals ovate oblong, $\frac{1}{10}$ inch long blunt dark red brown. Petals narrower linear similarly colored. Lip side lobes small erect truncate yellowish, midlobe cordate acute, notched on either side, violet with centre and edges white. Spur nearly as long as the pedicel parallel to it or deflexed cylindric slightly flatened, violet, an oblong recurved fleshy lamina truncate in the mouth, spur not divided. Column rather tall violet, wings obscure. Anther white scull shaped truncate emarginate in fruit. Pollinia flattened globose orbicular, 2 bilobed, pedicel, flat, narrowed above and below, slightly dilate in the middle, disc very small oblong. Rostellum lobes short oblong truncate with deflexed points. Stigma cordate.

Perak: Kamuning (A. D. Machado). Flowered Singapore Botanic Gardens 1906, December.

This is near *S. Scortechinii*, but has the habit of *Spensile*, Ridl.

Trichoglottis punctata, n. sp.

Stem slender branched 18 inches long, sheaths ribbed 1 inch long, leaves narrowly lanceolate acuminate 4 inches long $\frac{1}{4}$-$\frac{1}{2}$ inch wide, narrowed at the base. Racemes $\frac{1}{8}$ inch long few flowered, 1 or 2. Flower $\frac{1}{4}$ inch fleshy, upper sepal oblong obtuse, laterals deltoid triangular. Petals oblong obtuse. Lip adnate to the column at the base, very fleshy, shorter than the sepals, base oblong channelled hardly spur-like, but excavate, below the column a linear flat lamina obtuse entire, apex bilobed dilate lobes rounded with obscure fleshy processes projecting from the tip, behind two horn like side processes, all glabrous column thick, anther skull-shaped shortly beaked in front. Stelidia thick subtriangular, rostellum very short and indistinct. Pollinia not seen. "Flowers yellow with red brown spots on the inside and reddish edging outside."

Sarawak: Lingga (J. Hewitt).

Only one specimen with a single flower seen.

Near *Tr. lanceolaria*, Bl. but the spur is less developed, the lip is distinctly bifid at the tip.

Sarcochilus fragrans, n. sp.

Stem 3 inches long. Leaves 9 linear lanceolate subfalcate narrowed at the base 6 inches long one inch wide, dull green coriaceous. Scape 5 inches long, subterete winged. Bracts persistent ovate $\frac{1}{8}$ inch long green. Flowers open three at a time. Pedicels $\frac{1}{2}$ inch long. Upper sepal orbicular obovate, lower ones much larger $\frac{1}{2}$ inch long orbicular ovate. Petals small $\frac{1}{4}$ inch long spathulate all white with a transverse line of one or 2 ocreous blotches. Lip $\frac{3}{4}$ inch long, side lobes oblong rounded, spur shoe-shaped narrowed to a blunt point, with a raised boss or tooth in the upper face, calli in the mouth three, 2 longer than the median one short blunt tooth-like. Lip all white except an ocre blotch below the mouth. Column short, with a long foot, white with an indian red bar on each side of the foot running up and meeting behind the column. Anther broad and flat, thin ovate shortly beaked. Pollinia 2 globular bilobed, pedicel very short, disc oblong lanceolate small. Clinandrium shallow. Rostellum bifid of two linear processes, column wings incurved. This pretty and deliciously fragrant orchid was found on a coffee-bush on Matang estate. It is allied to *S. unguiculatus*, but very distinct.

S. stellatus, n. sp.

Stem thick 3 inches long. Leaves 6 oblong obtuse unequally bilobed 4 inches long and one inch across, thick and stiff. Racemes ½ inch long. Bracts small ovate. Flowers expanded, ovary and pedicel ¼ inch long, sepals ½ inch long spreading oblong acute pale greenish yellow. Petals smaller linear oblong acute. Lip ¼ inch long, side lobe oblong rounded broad yellowish, with dull Indian red and ovate markings inside, spur short blunt white, a large rounded callus just below the lobes white with 2 violet spots. Column longer than the foot ¼ inch long yellow, anther thin ovate acute, with a bar-shaped rib across the top. Pollinia semilinear yellow, pedicel linear short, disc small oblong. Clinandrium very shallow. Rostellum lobes short broad triangular. Capsule sessile oblong an inch long.

Sarawak: cult. in Bishop Hose's Garden exact locality uncertain, Sept. 1905. A pretty little plant with its green starlike flowers. The pollinia curl forward and hang into the stigma. The plant appears to be thus regularly self-fertilized.

Dendrocolla fimbriata, n. sp.

Stems 1½-1 inch long forming large tufts. Leaves lorate 3 inches long ½ inch wide pale green. Scapes 2 inches long, rachis thickened. Flowers white. Sepals lanceolate, lower ones oblong lanceolate acute with a process at the base. Petals lanceolate spathulate smaller. Lip convolute acute pubescent, side lobes distinct rounded, median linear obtuse all white and fringed with hairs, a callus short oblong truncate in the centre of the lip maroon edged with yellow a tuft of hairs behind it, an orange spot in the spur. Column short white, broad belly depressed in the centre, foot short. Clinandrium not raised. Anther skull-shaped retuse in front broad. Pollinia pale yellow oblong on a short triangular disc, no pedicel. Rostellum short indistinct.

Sarawak, on trees near the race course Sept. 1905 (Ridley and Hewitt).

Allied to *S. trichoglottis*, Hook. fil. which occurs there too, conspicuously different in its white flowers, and the lobed lip. A very pretty little plant, and fragrant.

Goodyera rostrata, n. sp.

Stem a foot tall. Leaves narrowly lanceolate slightly falcate acuminate at both ends and distinctly petiolate, 5 inches long including the petiole (1 inch) sheaths short papery.

Raceme (in bud only) rather crowded. Bracts ¼ inch long lanceolate acuminate. Pedicel hairy short.

Sepals hairy red, upper one lanceolate, base gibbous, adnate to the thin pale petals, laterals connate ovate hairy blunt red. Lip shorter, base thin saccate equalling the rather long curved beak, red, glabrous inside with no calli.

Column short with small rounded side wings. Anther very long beaked. Anther cells gibbous. Beak curved cylindric acute longer than the sepals.

Rostellum entire large spathulate, truncate, base narrowed dilated upwards into broad wings, shorter than the anther, minutely pustular with a strong rib up the centre.

Sarawak : Lingga, (J. Hewitt).

Differs from *Grubens* Bl. in the long beaked lip and entire broad winged labellum, and narrow leaves.

Habenaria pelorioides, Rchb. fil. Trans. Linn. Soc. XXX. p. 139. Tab. 27.

This plant was described from a specimen, obtained in Amherst, Tenasserim by Parish. The specimen, in Herb. Kew seems to be very ill-preserved, and it is suggested that it is an abnormal form, of some other species. Mr. Micholitz has recovered what appears to be the identical species in Tonkin. It was he says abundant and I have three good specimens. In habit foliage and perianth it is absolutely identical with Reihenbach's figure except that it has a short distinct conical spur to the lip, pendant, about half the length of the petal. The column however differs. From the side of the anther projects a triangular flap, about half its length at the base, behind this is a papillose stigma. The rostellar lobes are broad inflexed fleshy truncate as long as the anther processes. The pollinia are more pyriform with long narrow pedicels widest at the apex and narrowing to a terete-portion ending in a small rounded disc. The flowers are white. The plant was obtained from Tonkin.

The species seems to be a good and distinct one, and I see nothing to suggest it is a monstrosity. The spur varies very much in length in the various flowers, and in some I cannot see any. In others very short not a quarter of the length of the petal. The minute ciliation of the lip and petals by Reichenbach is really a very minute denticulation.

H. geniculata, Don. this fine white *Habenaria* was also brought by Mr. Micholitz from the same locality.

Habenaria borneensis, n. sp.

Whole plant 6 inches to a foot tall, tubers subcylindric. Leaves crowded at the base of the stem, lanceolate acuminate 3 inches long ½ inch wide glabrous bright green drying black. Raceme 9 inches or less, floriferous nearly to the base. Flowers very numerous crowded green. Bracts narrow lanceolate acuminate with a long point, keeled and the lowest 3 nerved, lower ones longer, much longer than the flowers. Sepals upper ovate lanceolate obtuse ⅛ inch long, lower narrower lanceolate. Petals broader ovate obtuse. Lip trifid, central lobe linear fleshy obtuse as long as the petals lateral lobes filiform more than three times as long with a broad flat base, spur thick cylindric about as long as the petals, tip bilobed. Column small. Anther short. Arms very small. Ovary ¼ inch long, narrow.

Sarawak: Matang. In clay banks in the coffee estate and on the path up the hill, Aug. 1905. (No 12475).

Habenaria roseata, n. sp.

Stem slender 2 feet tall. Leaves distant few, linear acute 3 inches long $\frac{1}{4}$-$\frac{1}{2}$ inch wide dull glaucous green sheathing at the base, upper one narrower and more acuminate. Raceme lax about 8 flowered. Bracts $\frac{1}{2}$ inch long lanceolate acuminate. Ovary and pedicel $\frac{3}{4}$ inch, not twisted, ovary narrowed upwards. Flower reversed. Upper sepals ovate obtuse boat-shaped forming a gaba with the oblong petals $\frac{1}{8}$ inch long pale pink. Lateral sepals oblique ovate obtuse strongly 3 ribbed spreading. Lip tufted to the base lobes narrow linear white median longest $\frac{1}{2}$ inch long. Spur $\frac{3}{4}$ inch long slender obtuse geniculate in the middle. Anther hooded nearly as long as the petals, arms rather long abruptly upcurved. Pollinia pyriform small with a very long slender pedicel. Stigmatic processes on the side of the anther distinct pustular. Stigmas porrect thick fleshy clubbed flat on the inner face. Rostellum trilobed erect, side lobes very short, midlobe linear pustular.

Siam at Trang (Cult. H. B. Penang, 1906).

This slender plant with pale rose flowers is allied to *H. Vidua* Parx. Rchb. f. a native of Tenasserim figured Trans. Linn. Soc. XXX. t. 27 B. The structure of the rostellum and stigmas is however different and the leaves are much narrower.

SCITAMINEAE.

Globba insectifera, n. sp.

Stem slender 14 inches tall, with cylindric pubescent sheaths lower ones reddish, 3 inches long, upper two with very small green lanceolate acute laminas nearly $\frac{1}{2}$ inch long $\frac{1}{8}$ inch wide. Panicle of a few short, inch-long branches. Bracts minute green oblong obtuse deciduous. Flowers sessile, ovary short oblong pubescent. Calyx tube $\frac{1}{8}$ inch long pubescent equally 3 toothed tubular. Petals narrow linear, staminodes large and conspicuous rounded ovate oblong ½ an inch long, ½ inch across bright yellow.

Lip small very narrow linear bifid at the tip for about ¼ its length, yellow. Filament long slender, anther orange with 4 equal triangular acuminate spurs.

Shan States, (Coll. Micholitz).

This very curious *Globba* came up in a plant of *Cypripedium bellatalum* cultivated in the Botanic Gardens. It is remarkable not only for its almost leafless habit, which is seen in some others of the species from this region, but especially from its very large staminode, the most conspicuous part of the flower. The flowers resemble some small yellow butterfly.

G. glandulosa, n. sp.

Stem 18 inches tall. Leaves lanceolate acuminate caudate hispid 4½ inches long, ¾ inch wide narrowed at base, sheath and ligule hairy. Panicle 2 inches long slender with few short branches. Bracts ovate oblong cuspidate glandular, ⅛ inch long. Calyx funnel-shaped with three equal lanceolate cuspidate leaves ⅖ of an inch long glandular corolla-tube twice as long shortly pubescent dilate upwards, lobes ovate obtuse dotted all over with glands. Staminodes linear much shorter. Lip short and broad half as long as the petals, bilobed lobes broad rounded. Filament rather stout. Anther with a single rather thick horn from near the base on each side, ovary glabrous ribbed.

Sarawak : Mt. Lingga (Hewitt).

Flowers light purple or red. Leaves with a red brown tinge on the under surface. The most curious thing about this species is the glandular dotting of the whole of the perianth, petals staminodes lip and filament. The hairy leaves and very short broad lip are also peculiar points.

Camptandra ovata, n. sp.

Stems solitary 3-6 inches long the base covered with oblong lanceolate sheaths 1-2 inches long cuspidate. Leaves 2-3 ovate peltate acuminate inaequilateral, base rounded, 1½-3½ inches long ¾-2 inches wide, petiole slender 1-1½ inch long, sheath less than half the length. Peduncle ½-1 inch long subterminal erect. Bract ½-1 inch long urnshaped with a recurved tip orbicular when spread out and an inch across. Flowers 2-3, nearly sessile. Calyx tubular dilated upwards shortly 3 lobed lobes blunt ⅛ inch long. Corolla tube slightly longer than the bract, lobes pale blue or white ¼ inch long blunt. Capsule oblong ⅜ inch long grey thin walled punctate and blotched brown, seeds several fusiform obtuse dark grey with a thin white fimbriate aril.

Selangor: Hulu Semangkok at about 4000 feet elevation, first collected by Mr. Burn Murdoch in February and later by myself in August 1904.

This is a much smaller plant than *C. latifolia* which in general form it resembles.

H. licmeres, n. sp.

Stem apparently tall. Leaves oblong lanceolate cuspidate narrowed to the base 20 inches long 2¼ inches wide, glabrous, ligule oblong rounded on the top ½ inch long.

Bracts papery linear acute, tips pubescent, 1½ inch long ⅙ inch wide. Inner bracts spathaceous narrow, tip pubescent. Calyx, tube narrow-spathaceous 2 inches long, tips of lobes silky hairy. Corolla, tube little longer, lobes linear obtuse red, about an inch long. Lip much shorter about ½ inch long, lateral lobes erect convolute, midlobe with a narrow claw ending in a broader triangular bi-lobed or hastate thicker limb. Anther not distinctly crested.

Sarawak: Kuching (Hewitt).

TACCACEÆ.

Tacca borneensis, n. sp.

A large tufted plant with the habit of *T. cristata.* Leaves ovate acuminate, petiole 6 inches or more long, blade 24 inches long, 9 inches across glabrous nerves about 9 pairs primary distant ascending one intramarginal running to the tip, margin undulate. Scape stout 6 inches long. Involucral bracts 4, subequal and similar, ovate sessile obtuse opposite pubescent on the back 2½ inches long 1½ inch wide, the two inner ones shortly petioled. Filamentous bracts rather short.

Flowers smaller than those of *T. cristata* purple. Sepals oblong slightly narrowed at the base apex rounded. Petals ovate acute mucronate, ¼ inch long. Stamens, with very short but distinct filament, anthers ovate base retuse, stigma, too-much crushed. Ovary and pedicel ½ inch.

Borneo: Sarawak on Matang, (Ridley.)

The broad ovate leaves of this plant would be quite sufficient to distinguish it from *T. cristata.* The involucral bracts too are very distinct, the outer ones broadly ovate, the inner ones narrowed slightly at the base, and all minutely and scantily pubescent. The flowers are smaller and the stamens more distinctly stalked.

T. laevis var. *minor.*

Differs from the description of the type in its generally smaller size. It has an erect cylindric stem 1½ inches long, leaves elliptic acuminate bright green 6 inches long 4 inches wide, petiole as long. Scape 6 inches or less deflexed or hardly ascending. Involucral bracts outer ones lanceolate acuminate an inch long, wide, inner ones ovate acuminate as long but much wider all olive green. Bracteoles filiform 5 inches long dusky tips paler flowers few pedicels thick purplish ¾ inch long. Perianth ½ inch across. Petals oblong triangular acuminate brownish green, spreading. Sepals erect about half the width. Stamens purple 6.

Fruit 1½ inch long green, 3 keeled to the sepals a ridge representing each petal.

Kelantan : Kwala Lebir (Dr. Gimlette.)

T. vespertilio, n. sp.

Stem short as in *T. cristata*, leaves numerous elliptic lanceolate long petioled, petiole sheathing 2 inches 6-8 inches long stout smooth lamina 12 inches long or less 6 inches across base rounded, usually unequal, one side further decurrent on the petiole than the other, tip acuminate margin minutely wavy, bright polished green above paler beneath, nerves conspicuous elevated beneath. Scape over a foot long smooth. Involucral bracts, 2 outer ones short lanceolate acuminate 1½ inch long by ½ inch purple tipped green, 2 inner ones sessile ovate at right angles to the others brown purple 2 inches long 1½ inch wide, margins wavy all glabrous. Flowers few 3-5. Filiform bracts 7 inches long about 12, base purple tips white Pedicels stout purple 1 inch long. Perianth tube campanulate purple ½ inch. Sepals lanceolate acute purplish ¼ inch. Petals broader oblong ovate obtuse. Stamens shortly pedicelled filaments short but distinct. Anther conic, retuse at base lobes excurved. Stigma peltate with three lobes retuse, plaits more deeply cut than in *T. cristata.*

Perak : Kamuning (Machado) fl. H. B. S. November.

This has flowered twice in the Botanic Gardens and is a very distinct plant in the matter of the large bracts, the two inner ones much larger than the outer ones and spreading like the wings of a bat.

SILIACEÆ.

Chlorophytum longissimum, n. sp.

Rhizome stout short 2-3 inches long. Leaves tufted, lanceolate acuminate narrowed at the base subpetiolate 7 inches long 1½ inch wide glabrous dark green. Raceme deflexed at first 8 inches long terete, with distant alternate flowers 1½ inch apart. Bracts lanceolate acuminate 1 inch long narrow. Pedicel shorter. Flower about 1 inch across, sepals and petals widely spreading similar lanceolate oblong narrow acute, pure white. Stamens connivent, filaments terete acuminate white longer than the anthers Ovary 3 lobed yellow, style as long as the anthers. stigma minute, white. After producing a few flowers the receme elongates to about 6 feet trailing on the ground, and bears bulbils.

Siam : Trang (St. V. B. Down, and Penang Gardens Collectors.)

AROIDEA.

Criptocoryne striolata var. *cordifolia.*

In streams on Siul hill near Kuching (Sept. 1905). I believe this is a variety of *C. striolata* but the leaves are ovate blunt, more deeply cordate, almost auricled. The flower spathe was purple. It grew with *Cr. grandis* Ridl. which has a yellow spathe.

Hapaline appendiculata, n. sp.

Leaves one or more, always few, erect ovate acute hastate, lower lobes lanceolate, sinus narrow, light green with curved ascending nerves 4 inches long, 2 inches across of which the lobes are 1 inch long petiole white 1½ inch long. Spadices several, entirely pure white, peduncle slender 1½ inch long white. Spathe linear acuminate 1 inch long very narrow hardly ⅛ inch across at the base, base convolute round the base of the spadix. Base of spadix adnate to the tube of the spathe, with 3 flask-shaped shortly stalked pistils on the opposite side. Stigma capitate yellowish. Male flowers few very irregular in shape the lowest oblong the others smaller, rounded. Appendage long filiform acuminate slender longer than the spathe.

Sarawak : at Puak, in woods. (H. N. Ridley).

This very curious little plant is the first species of the genus recorded from Borneo, the other two species being natives of Nepal and Kedah. This little plant is remarkable for possessing a very narrow spathe and a long slender appendage with no trace of flowers on it, and only a few irregular male flowers on the base. In the other species the male flowers occur to the top or nearly to the top of the spadix and the appendage is very short. The slender white spadices are usually deflexed and lie on the ground, looking like white roots.

Alocasia Villeneuvei.

This aroid is very common in Sarawak especially on the hills of Matang and elsewhere, and the plants often attain a large size. The flowers of it have never been described. I was fortunate in finding it well in flower in August 1905. The peduncle of the inflorescence is 6 inches or more tall but deeply sunk in the petiole sheaths, it is pale green in colour. The spathe is pure white, the swollen part of the base 1½ inch long and nearly an inch in diameter. The ovate lanceolate acute and cuspidate limb is 2½ inches long and 1½ inch wide white. The spadix is sessile 4 inches long. The pistils subglobose with the stigmas on a short thick distinct style. They are round, oblong or ovate and wide white. There are no abortive flowers mixed with them as is often the case in other species. Above them are some abortive female flowers. The male portion appears above the tube, it is only half an inch long the flowers close packed crenulate. The appendix is cylindric and obtuse reticulate, cream colored. The fruiting spadices are white. The spadices shortly after opening were found to be swarming with dipterous larvae. In large plants the inflorescences are numerous.

Alocasia Beccarii, Engler.

Is an anomalous species in many ways, in its creeping rhizome and entire leaves. I found it as before on Serapi, the top of Mt. Matang. It was in fruit, and I observed that instead of the tubular portion of the spathe, covering the fruit, disrupting irregularly as is usual in Alocasias, the top of it came off whole in the shape of a small conical cap, exposing the orange red fruit standing in a regular cap. In *A. denudata* the spathe base disrupts irregularly.

Homalomena Lindeni, *Alocasia Lindeni*, Ill. Hort. 1886 p. 111, Pl. DCLII.

This plant was originally described (l.c.) under the name of *Alocasia Lindeni* having been introduced from "Papouasia" by Linden, who suggests that it may be a Homalomena.

A plant obtained from Rangoon this year flowered in the Botanic Gardens Singapore, and *proved* to be a species of *Homalomena*. The leaves are ovate cordate 6 inches long and as wide, deep green with yellow veins, petiole 11 inches long sheathing for 3 inches, white. The plant when cut or broken exhales a strong scent of aniseed.

The spathes are produced several together each on a greenish white peduncle 3-4 inches long, 1/8 inch thick. Spathe cylindrical 2½ inches long tightly fitting the spadix, pale green darker towards the tip where it ends in a mucro 1/8 inch long. The spadix barely longer sessile. Female portion 1 inch long, rachis thick and white, pistils very numerous, cylindric rounded, green, stigma round flat capitate, broader than the ovary, white, no abortive flowers. The male portion cylindric slightly tapering at the tip, white, flowers oblong, very numerous.

Homalomena multinervia, n. sp.

Leaves elliptic acuminate, slightly oblique, base cuneate 8 inches long 3¼ wide, nerves primary very numerous, about 50 pairs, hardly distinct from the secondary ones, petiole rather slender 4-5 inches long. Spathes thick 3 inches long constricted above the female portion with a long slender mucro, $\frac{1}{8}$-$\frac{1}{4}$ inch long, peduncle 3 inches long. Spadix little shorter than the spathe. Female portion an inch long. Pistils numerous globose, no abortive flowers visible. Spadix sessile.

Sarawak : Lundu (Ridley Sept. 1905).

The very close nervation of the leaves, which are also thickly dotted with dark colored dots, and the large constricted spadix distinguish this from allied species.

Homalomena Griffithii var. *falcata.*

Stem stout 2-3 inches long. Leaves long petioled ovate with a broad base, apex falcate acute, nerves about 7 pairs 6 inches long 4 inches wide. Spathes several, on slender red peduncles 1$\frac{1}{2}$ inch long ; curved cylindric acuminate $\frac{3}{4}$ inch long, male and female portions of the spadix equal. Female flowers in 4 spirals.

Kuching : (Ridley 12417).

Schismatoglottis multiflora var. *latifolia.*

Mr. Hewitt sends from the Sarawak Museum a specimen of a plant collected on Matang by Mr. Bartlett July 21, 1895, which resembles *Sch. multiflora* except in the leaves which are much broader elliptic cuneate at the base, tip acuminate, 8 inches long 3 inches wide. The flowers ill-preserved seem identical with those of *Sch. multiflora.* I propose the variety *latifolia* for it.

Sch. nervosa, n. sp.

Stem stout erect 2 inches long. Leaves ovate obtuse cordate, lobes rounded, 7 inches long by 4 inches wide dark shining green, nerves about 26 pairs conspicuous gradually ascending, midrib channelled, above thick elevated beneath, back of leaf pale, petiole 6 inches long smooth green channelled above, sheathing for 3 inches, sheath pale tapering upwards, thin spathe very shortly $\frac{1}{2}$ inch, thickly peduncled, with a lanceate bract keeled, 2 inches long mucronate subtending it. Spathe green 3 inches, limb lanceolate cuspidate as long as the tube, tube swollen at the base then narrowed. Spadix 3 inches long, male portion cylindric acute $1\frac{1}{4}$ inch long white flowers similar to the tip. Below a narrowed portion, female portion $\frac{1}{2}$ inch cylindric dilated towards base, on a stout short peduncle. Pistils very numerous small cylindric oblong narrow in 13 spirals dilated above with a small pulvinate stigma, no sterile flowers intermixed.

Sarawak: Bau (Ridley). This plant brought alive from Sarawak flowered in the Botanic Gardens in January 1907.

Piptospatha remiformis, n. sp.

Stem short suberect. Leaves narrowly elliptic, tip rounded cuspidate, base cuneate 3 inches long $\frac{1}{2}$ inch wide, nerves about five pairs ascending rather inconspicuous, blade dark green minutely pustular, petiole slender 2 inches long, sheathing about half an inch. Peduncle $1\frac{1}{2}$ inches long, spathe absent. Fruiting spathe turbinate $\frac{1}{4}$ inch long.

Sarawak: Mt. Lingga (J. Hewitt) Only a single specimen was collected of this plant, and that only fruiting. It seems however a distinct little species in its foliage, though it must be admitted that as in most other aroids the foliage of this genus is apt to vary very much. The leaves in outline resemble a native boat-paddle.

Raphidophora grandis, n. sp.

Stem very long and stout over an inch through. Leaves of climbing stem ovate obtuse cordate 4 inches long 3 inches wide, shining light green, very closely imbricate. Leaves adult of free part of stem very large, the blade 18 inches long 9 inches across or more, pinnatifid with subalternate lobes 1 to 3 nerved truncate broadly, lower ones acute at the upper margin, secondary nerves 5 to 9 between each pair of main nerves, transverse nervules conspicuous when dry numerous undulate petiole woody 6 inches or more long $\frac{3}{16}$ inch through, knee short. Spathe peduncle stout woody 6 inches or more long ¼ inch through, spadix sessile 6 inches long ½ inch through cylindric. Pistils oblong longer than broad. Stigma linear stamens projecting. Anther cells ovoid.

Sarawak on big trees at Tambusan Sept. 1905. (Ridley 12414).

A fine plant either with its neat creeping stem, with its overlapping oval leaves, or with its fine Monstera-like full grown foliage.

R. elliptica, n. sp.

Stem slender woody branched, nodes an inch long, ⅛ inch through when dry. Leaves remote elliptic inaequilateral narrowed at the base, acuminate rather abruptly, glabrous thinly coriaceous drying black 4 to 9 inches long 1-2½ inch wide, petiole slender 2-3½ inches long. Spadix on a peduncle ¾ inch long. Spathe oblong acuminate boat-shaped 1½ inch long coriaceous. Spadix sessile obtuse cylindric 1 inch long, ¼ inch through. Pistils rounded hardly angled. Stigma round-pulvinate.

Sarawak : Kuching (Hewitt) Oct. 3, 1905.

A Journey into the Interior of Borneo to visit the Kalabit tribes.

By R. S. Douglas.

I propose to give a short account of a journey I recently made to visit the Kalabits, a people who had only quite recently acknowledged allegiance to the Sarawak Government, and are quite one of the most uncivilized in Borneo.

The Kalabits, who are scientifically I believe of the Indonesian race, are an agricultural people inhabiting the large tableland in the centre of Borneo from which spring the Baram, Tutau, Limbang, Trusan and Padas Rivers on the West Coast and the Bahau River on the East Coast. They are very industrious and are one of the few tribes who farm by irrigation, and are therefore able to obtain two crops of paddy in the year. They are practically the same race of people as are known as Muruts in the Trusan and Padas Districts.

In build they are above the average height of Bornean natives and are well made. They are tremendous walkers (a fact which is impressed on one by the size of their feet) and it is said by Kayans that they are capable of walking in one day what other people would take two days to accomplish. This I can quite believe, as all getting about having to take place on foot they are naturally very adept and hardy at this method of progress. They have however absolutely no idea of paddling or using a boat, and when they were first brought down to the Government station at Claudetown, and saw the Baram River, they sat down in the bottom of the Kayan canoes and burst out crying, having never seen such an enormous volume of water before.

As a lot of these people had just moved into the head of the Tutau River I determined to proceed by this route, although it meant crossing the Mulu Range of hills.

On the third day of my departure from the Government Station at Claudetown I picked up Dyau Blawing, the Kenyah chief who was going to escort me on my journey. After leaving his house, we proceeded on up the Tutau River till we reached the Tepin River.

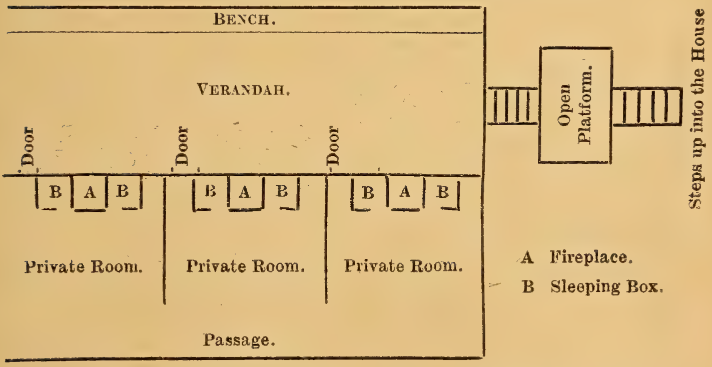
Here the river becomes impracticable for boats on account of rapids, so the next day we started climbing up the hills, which flank the river. We were met by a party of Punans, the wild people who live in the jungle, who had been called by Dyau Blawing to show us the route over the hills. The going was very bad and fatiguing, as we had to clamber up and down the spurs of Mt. Mulu until mid-day, when we reached the foot of a hill called Bukit Sigerun Sigop, called so by the Punans on account of the wild tobacco growing there (Sigop being the Punan name for tobacco). We did not reach the summit of this hill till 5 o'clock in the evening when we must have been at least 5,000 feet up. I decided to encamp here for the night, as we were all very tired and hungry. Cooking was managed with difficulty as there was no water to be found near the summit. It was lucky for us we had the Punans with us, as they soon produced some liquid, which they had found in a pig's bathing place and which therefore did not look very appetising; still beggars cannot be choosers, so we had to make the best of it. It was bitterly cold all the night.

The next morning we started on the descent, and when the mists had cleared away the view was perfectly magnificent. At our feet in what seemed a crack in the hills, flowed the Tutau River whilst all round hills towered up to some thousands of feet. At midday we got through the range of hills and from a spur had a still more beautiful view. Right in front of us was the Kalabit country laid out like a map, and as this tableland is comparatively flat, we could see for miles and miles. Away to our right to the South, were the hills in which rise the Pata and Akar rivers, tributaries of the Baram. In front of us rose up Mts. Pamabo and Murud, which separate the head waters of the Baram River from the Trusan; whilst on our left were the ranges which separate the Tutau and Limbang waters.

In the afternoon we reached the Tutau River again at Long Taoh and the next day continued our journey in some canoes we found there. We then branched off up a tributary called the Magoh and on the second day from leaving Long Taoh reached the first Kalabit villages at the mouth of a small stream called the Seridan. On our arrival we were saluted with salvoes of firing from muskets and bedils and tremendous cheering, to which we retaliated to the best of our ability. The chief Ili Bawang received us at the landing place and a sort of triumphal procession was made up to the house, where my escort were regaled with 'borak' (rice beer) and smokes, to refresh them after the fatigues of the journey.

The people of this village, who numbered some two hundred souls, had quite recently moved here from near the headwaters of the Trusan, and their chief, Ili Bawang, had evidently taken a lesson from the dimensions of the long Kayan houses in the Baram River as he had constructed a splendid house on a scale hitherto unattempted by Kalabits, whose dwellings are generally veritable hovels.

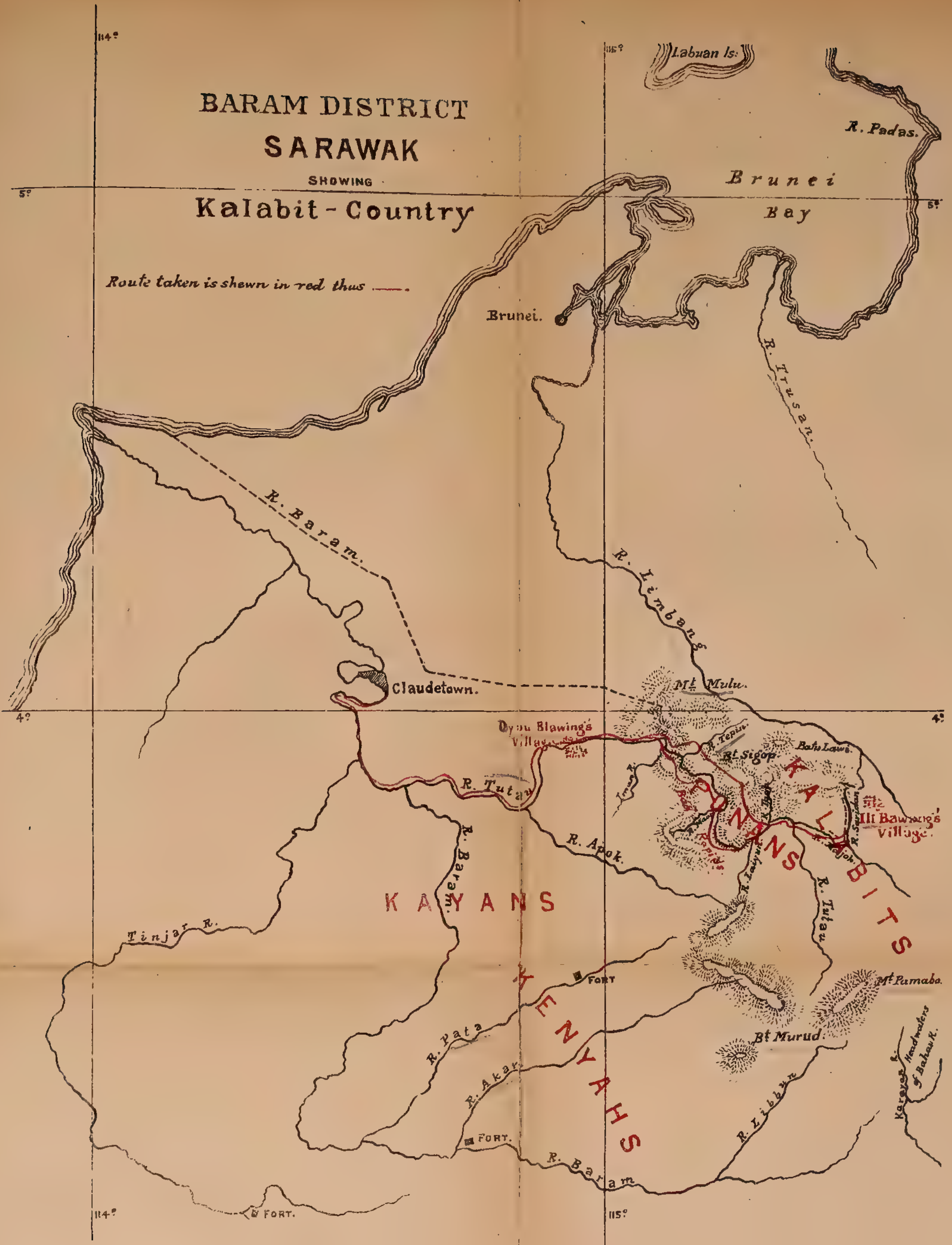
I append a sketch of the ground plan of the house.


BENCH.
VERANDAH.
Door
Door
Door
B
A
B
B
A
B
B
A
B
Private Room.
Private Room.
Private Room.
Passage.
Open Platform.
Steps up into the House
A Fireplace.
B Sleeping Box.

A wall divided the house in two lengthwise; the front half was a wide verandah of about 20 feet whilst the back part was divided up into rooms, each family having a separate room. The dividing wall however did not extend to the back wall of the house, as they do in Kayan and Dyak houses, thus leaving a passage, by which communication could be kept up from one end of the house to the other, without it being necessary to come out into the common verandah. This passage I found was used by the women, who did not appear in the verandah except on special occasions. In the centre of the middle wall was erected an enormous fireplace and on either side of this was a sort of kennel, in which the married couples slept. These were not walled in on the side next the fireplace, so as to get all the warmth possible, but of course as there was no chimney, they also got their full amount of smoke, and soot. The cold at night quite warranted these people desiring a close proximity to the fire, and I found also that a plunge into the river in the morning seemed as icy and as exhilarating as a cold bath in England.

The next day all the Kalabits collected from the villages round to the number of five or six hundred, and a grand feast was held; a buffalo and nine pigs were killed. I must admit that although the feast was a fearful orgy, still I could not help admiring the thoroughness with which these people enjoyed the meal. They began to eat at about noon and did not stop doing so until the evening and then only because there was nothing more to eat. All that was left of that buffalo were its horns and leg bones, which even Kalabit indigestion seemed to shy at. The skin I found was being eaten with the hair still on and evidently relished. Of the pigs nothing was left at all.

The meal being finished, some twenty jars of 'borak' were produced and a drinking bout was started, which lasted till day-light. Whilst this was going on, all the women, attiring themselves in their best clothes and ranging themselves in a long line one behind the other, clasping the shoulders of the one in front, began to march round the house, up the verandah and down the passage at the back and then out into the verandah again. The leader of this procession suddenly burst forth into song, whilst the others joined in the chorus, keeping time with their feet. Although their voices were rather raucous, still the song had a weird plaintive air, which was decidedly fascinating, and to which the smoky torches and wild faces made an impressive 'mise-en-scène' The song was



BARAM DISTRICT
SARAWAK
SHOWING
Kalabit-Country

Route taken is shewn in red thus ——.

114°
115°
5°
4°
Labuan Is.
R. Padas.
Brunei
Bay
Brunei.
R. Trusan.
R. Limbang.
R. Baram.
Claudetown.
Mt. Mulu.
Oyau Blawing's Village
R. Tepu.
Bt. Sigop.
Batu Lawi.
R. Tutau
R. Apok.
R. Baram.
KALABITS
PUNANS
Rapids
Ili Bawang's Village.
R. Kajok.
R. Laiyun.
R. Tutau
KAYANS
KENYAHS
Tinjar R.
FORT
R. Pata
R. Akar
FORT.
Mt. Pamabo.
Bt. Murud.
R. Libbun
Karayan R.
Headwaters of Bahau R.
R. Baram
FORT.
114°
115°

a historical recitation of the brave deeds done by their forefathers in the days of yore down to the present time, when they first came into touch with Europeans and the Government. The rhythm gradually got faster and faster until the march became a quick-step and then a double, whilst the soloist kept time by beating the floor with a stick. Presently the men got carried away with enthusiasm and joined on to the line behind, until there must have been a procession of over a hundred performers careering round the house, shouting the choruses at the top of their voices, but all keeping tune and time. The song then suddenly ceased, and the men returned to their drinking and the women to their duties in the rooms.

The next morning I went and visited the villages near by, but was not much impressed by their appearance as the houses seemed horrid dirty hovels. At one of these villages I saw the people having a rat hunt. All the men, women and children armed with sticks were engaged in turning over the heaps of rubbish and filth accumulated under the house in search of the wily rodent, which is considered a great delicacy by the Kalabits. Whenever a rat was seen, there was a tremendous 'view halloa' and the whole crowd flung themselves violently into the chase, frequently whacking one another in their attempts to slay their prey. They also lay very ingenious traps, made of bamboo and rattan, all over their houses to catch them.

I was very much struck with the industry of the women; they never seem to stop working and never shield themselves from the sun by means of sun-hats or head handkerchiefs. They wear a short skirt reaching to the knee just like the Dyak women. They are great smokers and are continually using a sort of brass cigarette holder, into which they stuff a little tobacco and puff away for a few minutes.

These people store their paddy in one large hut, which is raised off the ground some six feet, to prevent rats and other pests climbing up. Inside, this hut is divided into separate rooms for the different owners.

That night another meeting was held and all the different chiefs proclaimed their loyalty to the Sarawak Government.

Dyau Blawing then toasted the Kalabit chief Ili Bawang to the rousing tune of the Kayan drinking song which with its rolling chorus was much appreciated by the Kalabits. Opportunity is taken during these extempore songs to tell the individual who is toasted the customs of civilized Government and to make certain trite remarks as to his former life and conduct, which he must now reform.

After this was over they settled themselves down to drinking, in which occupation every night was spent during our visit there. I noticed that when a drink was offered to any man, all the people near by caught hold of the arm of the giver, those further off catching hold of the arms of those nearer, thus making the drink appear to come from all of them and so the harder to refuse. If a chief was being offered one it often happened that some thirty or forty persons would collect round him to assist in forcing the liquor down his throat.

The Kalabits were the most generous of hosts, and whilst we stayed with them we wanted for nothing in the way of food, and every day presents of fowls, eggs, sugarcane and sweet potatoes were brought to us. They seemed genuinely pleased to see us and compared favourably their life under the Government to their former one further in the interior, with its constant alarms of war and rumours of war.

On the fourth day I received their poll tax, and, as dollars or coins of any sort were unknown in these regions, it had to be paid in rubber; every married man therefore paid in three katties of rubber.

The next day we started on our return journey. We were escorted down to the landing place by the whole population, and amidst the banging of guns and repeated expressions of 'au revoir' and wishes for a safe journey, and the usual accompaniment of cheering, we started down-river.

Our return was very different from the journey up; there was no hard poling and pulling up rapids, for with our experienced boatmen, these were shot with ease in quick succession.

At midday we reached the mouth of the Magoh River and here I had arranged for a meeting of all the Punan tribes who range through the dense jungle round here. We found about fifty of these strange wild people awaiting our arrival. They live entirely on the produce of the jungle. Wild sago and fruit constitute the greater part of their food. When they find a clump of wild sago they encamp there until it is finished and then move on in search of more. They work the sago in the usual way by felling the trunk and then splitting it in two, then the pith is scooped out with a piece of bamboo tied on to the end of a stick. The end of the bamboo is scraped until it presents a sharp edge which easily works through the soft pith.

Their chief weapon of offence and defence is the deadly blowpipe, from which they shoot out poisoned darts. With these they kill pig and deer, and even rhinoceros have been known to die from the effects.

We spent the night at Long Taoh, as Dyau Blawing had decided to attempt to shoot the rapids below here, the water being just the right height to enable us to do so; as if the water is too high the waves are so big that a canoe could not stand them; whilst if the water is too low the sharp edged rocks show up, making it too dangerous to proceed.

This was a great piece of luck, as it saved us making the ascent of Bukit Sigerun Sigop again, and thereby we gained a day, to say nothing of escaping the trouble and labour of the climb. Besides this we had the exciting experience of shooting the dangerous rapids through the gorge, about which I had heard so much; and was glad of having the chance of seeing them.

We started early the next morning and soon got to the mouth of the gorge, where two spurs of the mountains, one from each side, run down to the river and form a narrow gateaway about twenty yards broad. As the river above this place is about a hundred yards in width, it can be imagined the pace at which the water pours through this narrow neck. We held on to the rocks here whilst the appearance of the water below was examined. It was a wonderful sight looking down the gorge. The river ran pretty straight at first and one could see for about a mile the water pouring down between cliffs, which rose perpendicular to the height of two or three hundred feet. The man in the bow of the canoe, apparently being satisfied with the state of the water, pronounced that the passage was possible and with a final injunction to sit still and hold tight, we let go and started off. Then ensued one of the most exciting times I have ever experienced. For five hours we simply flew down between those cliffs, without a single stroke of the paddle to assist us, except a quick touch every now and then from the men in the bows and stern to keep the boat straight or to avoid a rock or whirlpool. It was breathless work and nobody seemed inclined to speak, but all attention seemed to be strained as to what was going to appear round this corner or that rock. On we dashed between those grim cliffs on which there was absolutely no foothold to be gained if the boat happened to upset. It gave one the idea of what one would imagine the river Lethe (Long Balek Mati, the River of Death, as the Kayans call it) to be like; although the sun was shining brightly above us still it was chilly and dull down in the gorge between the grey limestone cliffs, whilst the mountains towered thousands of feet above us, and absolute silence reigned, except for the hiss of the rushing waters; and no sign of life was visible.

Just before noon a small cleft in the cliffs on the left bank appeared, where the Maap stream tumbles down a valley between the hills and manages to burst its way through the rocks. This being the first place when it was possible to obtain a foothold, we got out and ate a hurried lunch, the water and weather being closely watched, as a heavy shower of rain would have caused the river to rise several feet and we should have been caught in a trap, unable to proceed up or down-river. Happily luck was still with us, and having finished our meal, we continued our career downstream. After about an hour we heard the roar of waves, which warned us that we were approaching a large rapid, and we quickly pulled into the bank, where, luckily, the cliffs were broken down, and, the pilot having pronounced that it was impossible to shoot this rapid, we carried all our luggage and hauled our canoes over the rocks to a place below the rapid. This proved very hard work as some of the rocks were thirty to forty feet high, and in one place where there was no way between the rocks, we had to pull the boats up the perpendicular face and let them down again the other side, dangling on to the ends of rattans. This process was repeated four times before we got through the gorge and reached our old encampment at Long Tepin, so it can be understood that we were very hungry and tired.

Each one of us, I think, heaved a sigh of relief when we got through the gorge and had left those grim grey cliffs behind; and for myself I am sure that, although the journey was a unique and exciting experience, still I have no immediate wish to repeat it. The grimness and solitude to which I have already referred were too awe-inspiring to make it exactly enjoyable. How it affected my followers was shown by the fact that, although the Kenyahs are inveterate smokers and are never without a cigarette between their lips, not one of them had touched tobacco the whole of that day.

What also struck me was the terrific pace at which the water ran through the gorge, and although I have been up rapids in the Baram River and up all its larger tributaries, still I have never seen the pace equalled. It is accounted for by the fact that the greater portion of the gorge is never more than about 40 yards broad, and the cliffs on either side are worn so smooth that there is absolutely no resistance aquainst this large volume of water. The natives aptly resemble it to "pouring water through a bamboo." When we had reached Long Taoh, we were much troubled with the rubber which I had received as tax from the Kalabits, as it loaded the canoes down too much to enable them to go safely through the gorge. Dyau Blawing persuaded me to allow them to despatch it in the way they sent their rubber through, when they had been trading with the Punans. I reluctantly agreed, and it was immediately strung piece by piece on to a long rattan until it made a huge rope about 50 yards long; it was then wound up in a gigantic ball about 9 feet in diameter, just like one winds up a ball of worsted. Just before we started this ball of rubber was pushed into mid-stream; Dyau Blawing promising that I should find it on the morrow ashore on a gravel bank near the Iman River.

On our passage through the gorge nothing had been seen of the rubber, so my anxiety was great. But on the morning after leaving Long Tepin, we reached Long Iman, and there, sure enough, on the gravel bank was the ball of rubber which proved to be none the worse for its rapid voyage. I was assured that this had been done hundreds of times with rubber and it always fetched up at Long Iman, even if it was occasionally detained by rocks or whirlpools. Once a ball of rubber stuck in the gorge for 6 months and its owners gave it up for lost; but it eventually turned up rather battered and broken at Long Iman.

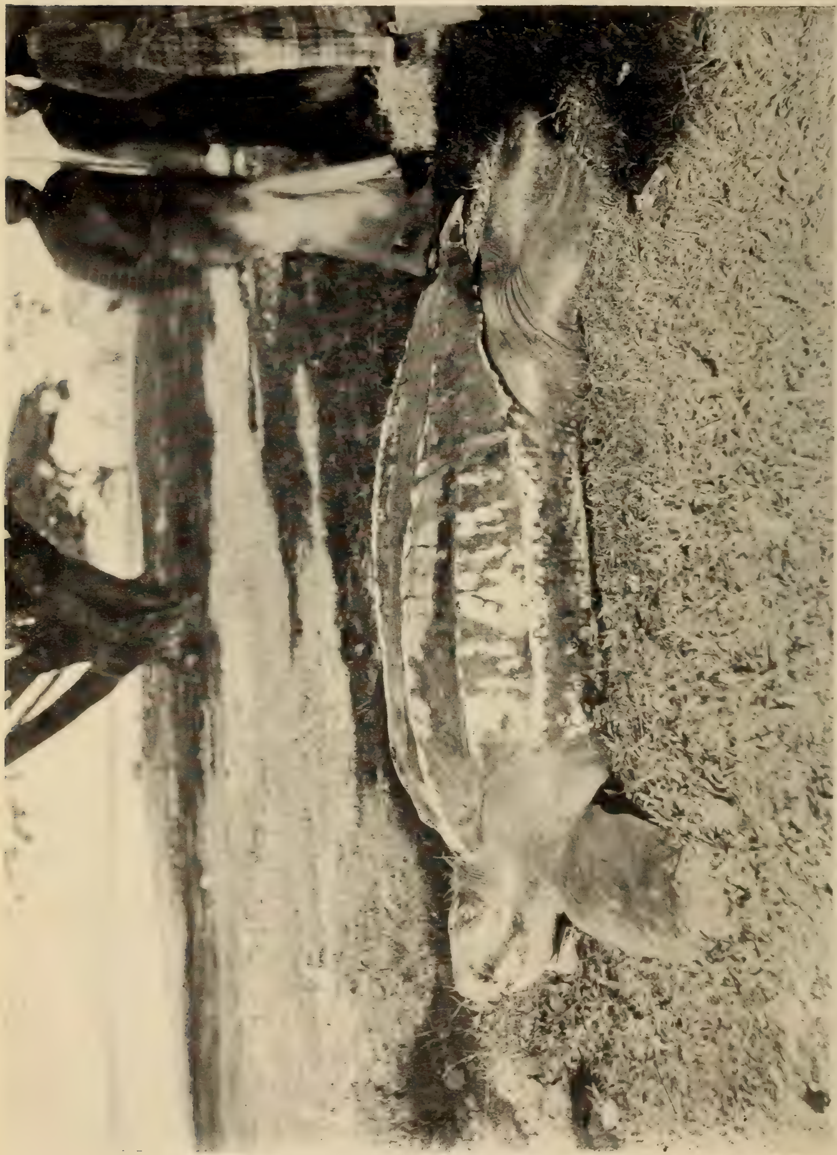
From here homewards there was nothing of interest in my journey, and after leaving Dyau Blawing and his escort at their village, I proceeded on and reached Claudetown after an absence of seventeen days, the return journey having only taken four days.

R. S. DOUGLAS.

Note:—The term 'Long' which is used, is a Kayan word meaning the mouth of a river. Thus Long Taoh and so forth.

STRAITS BRANCH, ROYAL ASIATIC SOCIETY.

JOURNAL 48. PLATE I.



Leathery Turtle (side view).

Notes on the capture of a rare Leathery Turtle (*Dermochelys coriacea*) in Johore waters.

C. Boden Kloss, F.Z.S.

Whilst residing at Johore Bahru in 1905 a specimen of the rare Leathery Turtle (*Dermochelys coriacea*, L.) was brought to me by Malay fishermen who had found the reptile entangled in their fishing stakes at Kampong Batu Jawa in the Johore Strait on March 11th of that year.

According to their account of its capture, for several days previously, the screens and nets of their *kelong* had been broken and torn by some unknown agency that at length, at day-break of that morning, proved to be an immense turtle of a kind unknown to them which had entangled itself beyond escape in the material of the damaged fish-trap. For a time they were at a loss to know how to dispose of their unwieldy capture, but finally brought out a large lighter which, filling with water, they sank beneath the turtle; then by baling out the water, the latter was soon reposing on the bottom of the dry boat, where unfortunately it shortly expired and was left exposed to the heat of the sun's rays until it reached me at three o'clock in the afternoon.

Getting it ashore was an operation of some difficulty for it was impossible to grip the creature in any way, and it was not until I had collected a gang of ten Chinese coolies furnished with poles and ropes that it was finally lifted from the boat and up the steps of the sea-wall.

The weight of this turtle—a male—I estimated as between nine hundred and one thousand pounds and the principal measurements taken were as follows.

Total length in straight line from tip of head to tip of tail	234 cms.	(7 ft. 8 in.)
Extreme breadth of carapace	84 ,,	(2 ft. 9 in.)
,, ,, between tips of extended flippers	240 ,,	(7 ft. 10 in,

In colour the upper surface was black, mottled with pinky white, while the lower parts were principally yellowish, scantily blotched with dark brown.

The carapace and plastron presented a mosaic-like appearance; the remaining parts were covered with smooth skin, that of the head being entirely free from shields of any nature as is sometimes reported.

The contents of the stomach consisted mainly of small fishes, prawns and other crustaceans, mixed with a lesser amount of different vegetable substances.

So little is this turtle known locally that it was some time before I could obtain a name for it, but at length the word "kambau" was given me with the additional information that the term also applied to anything slow or sleepy, such as a *prau* in a calm, or light head-wind.

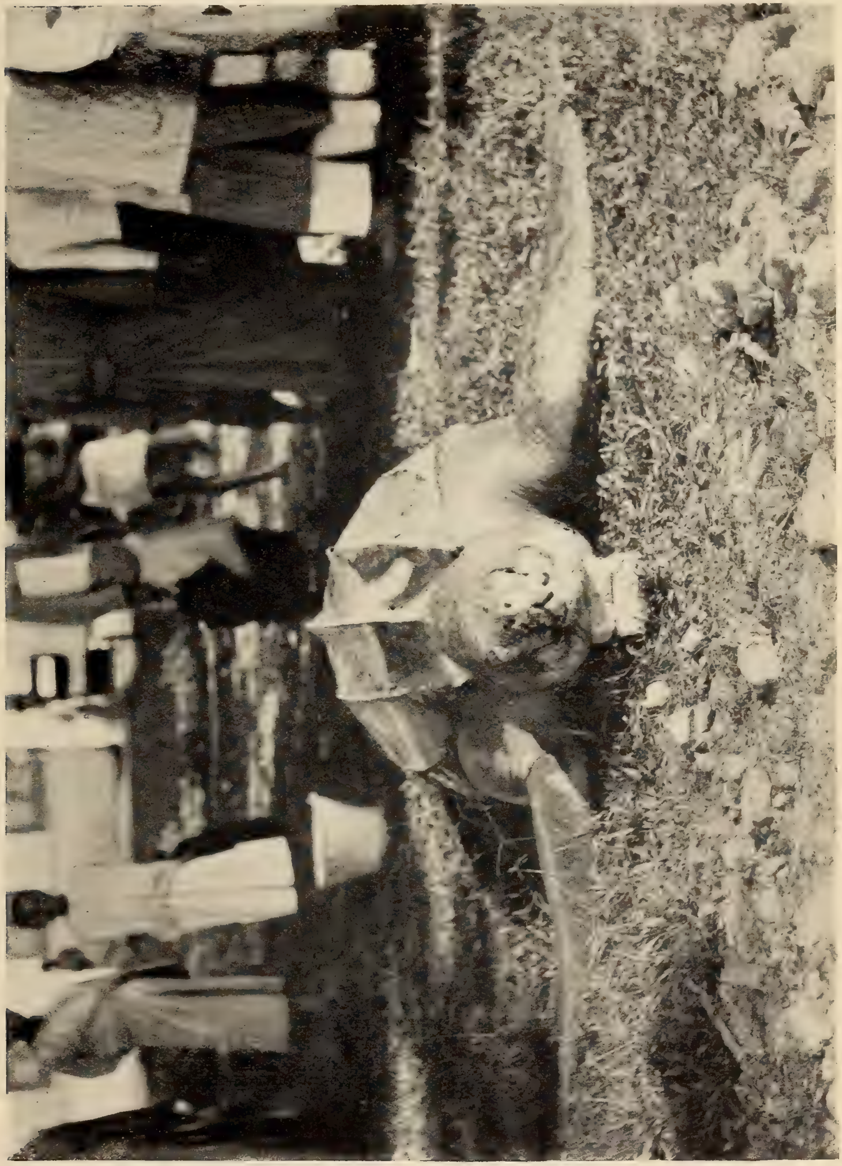
Various circumstances, besides its already somewhat putrid state, prevented me from preserving this valuable specimen in its entirety, but early on the following morning I obtained a number of prisoners from the gaol and with their help got out the skeleton. The flesh, though said to be of a rank and unpleasant flavour, was eagerly begged for by numerous Chinese as soon as stripped from the carcase. The novel appearance and huge size of the reptile were causes of much attraction, and all the afternoon during which it was lying on the sea-front, it was a centre for crowds of interested people.

Though the species is widely distributed through tropical seas (and is occasionally noted outside such areas) I know of only one other example captured in our locality, and this—a much smaller specimen—was forwarded to the Raffles Museum, where it is now exhibited, by Mr. A. M. Skinner who obtained it at Tanjong Katong, Singapore, in 1884. The Johore specimen may therefore take rank as the second recorded capture in this part of the Malayan seas.

A full account of the anatomy of the Leathery Turtle, based on the investigation of a small Japanese specimen, appeared in a recent number of the P. Z. S. (1905, Vol. I Pt. II) but my photographs of this locally-obtained individual

STRAITS BRANCH, ROYAL ASIATIC SOCIETY.

JOURNAL 48. PLATE II.



Leathery Turtle.

are reproduced here as hitherto illustrations of this species have given in general a far from accurate representation of its appearance.

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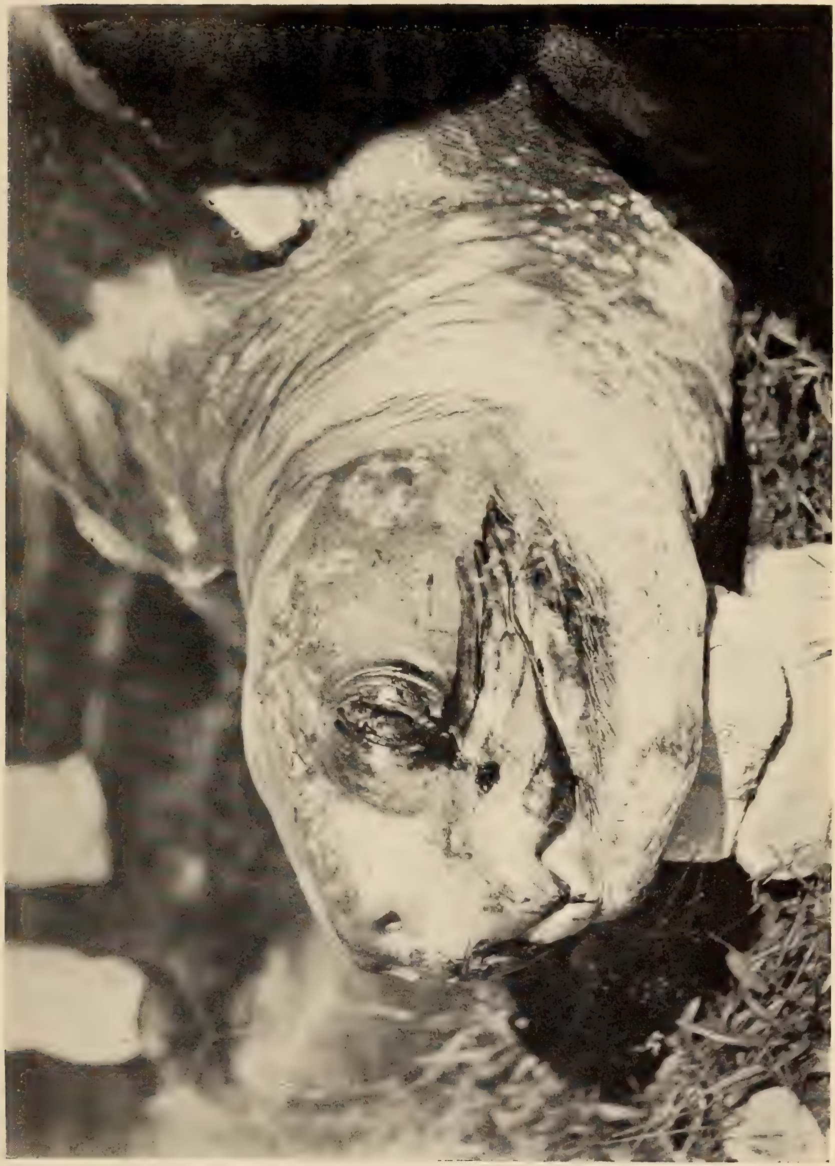
JOURNAL 48. PLATE III.



Leathery Turtle (Head).

Malayan Pigs.

A Recent Zoological Paper.
G. S. Miller's "Notes on Malayan Pigs."

BY C. BODEN KLOSS, F. Z. S.

One of the most recent of publications dealing with the fauna of the Oriental region is a most interesting and valuable paper by Mr. Gerrit S. Miller, which throws a fresh light on the varieties and distribution of the pigs of the Malayan area.

"Notes on Malayan Pigs" * is based on a quite unique collection of 62 specimens from the Malayan Peninsula and Islands, presented to the U. S. National Museum by Dr. W. L. Abbott, and a small contribution of 4 specimens obtained in Johore by myself. In addition to having all this material to work upon Mr. Miller has also examined the types and collections in the Natural History Museums at Berne, Berlin, Leyden and London.

Excluding the Javan species (as not being yet represented in the U. S. N. M. collection) the pigs of Western Malaya are broadly defined as belonging to one or the other of three groups typified as the Barbatus group, the Cristatus group and the Vittatus group.

In the first group, the "bearded pigs," of greatest local interest perhaps is *Sus oi*, Miller, the species which occurs in the Sumatran area, and is, so far, known from the swampy plains of south-eastern Sumatra, from Banka and from the Rhio Archipelago, where, inhabiting Pulo Battam, it most closely approaches the Straits Settlements.

The other members are *Sus barbatus*, Müller, of Borneo, with which Mr. Miller finds *Sus longirostris*, Nehring, to be synonymous, and a new species, *Sus gargantua*, founded by Mr. Miller on the skull of a young adult male from south-eastern Borneo. This, besides being the largest of known living pigs (upper length of skull of *young* adult 570 mm., of *old S. barbatus* 510 mm.), is further distinguished by having its extremely low occipital region produced backwards to a degree quite unknown in others of the group.

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* Proceedings of The United States National Museum, Vol. XXX pages 737-758, with Plates XXXIX—LXIV.

The members of the Cristatus group are confined to the mainland and the near-by islands. It has long been thought that the wild pig of the Peninsula was the same as the *Sus cristatus*, Wagner, of India proper and when writing a note on the Sumatran *Sus oi* for the Journal (No. 45, p. 60), I stated that " only one species of wild pig is at present known to occur in the Malay Peninsula and that is the animal regarded as identical with *Sus cristatus* of India," but it appears that the animal ranging from Tower Tenasserim southwards must now be separated from the Indian form. It is now described under the name of *Sus jubatus ;* and to a form from Pulo Teratau, and perhaps other islands off the west coast of the Peninsula, that is like *jubatus* but not as large, Mr. Miller has given the name *jubatulus.* It is unfortunate however that in making into a separate species an animal that inhabits a shoal-water island situated close to the mainland, the author has only one example to work upon.

The pigs of the Vittatus group are purely insular except one new species from the southern extremity of the Malay Peninsula. They range from the Andamans and Nicobars in the west to the Natunas in the east. The typical *Sus vittatus*, Müller and Schlegel, inhabits the mainland of Sumatra and the Rhio Archipelago form now becomes a separate species under the name of *rhionis.* The largest known member of the group, which is specially interesting as inhabiting the Asiatic mainland (so that the Peninsula is now found to possess at least two peculiar pigs), occurs in Johore. This is *Sus peninsularis* and presumably the pig of Singapore Island is of this species also.

The remaining species of this group are widely distributed. On Pulo Nias, on Pulo Babi together with Pulo Tuanku and lastly on Pulo Simalu, all islands of the West Sumatra chain, are found respectively *Sus niadensis*, *Sus babi* and *Sus mimus* all described for the first time. The animal that occurs in the islands of the Natunas between the Peninsula and Borneo is *Sus natunensis*, Miller, while *Sus nicoboricus*, Miller, is known as yet by specimens from Great Nicobar Island only. The smallest member of the group—smaller even than *nicobaricus* or *mimus*, is *Sus andamanensis*, Blyth. from the Andaman Islands.

The paper contains full descriptions, keys and measurements, and is illustrated by many plates (amongst which are reproductions of a mounted *Sus barbatus*), of mandibular teeth and skulls in various aspects, all of which greatly facilitate the identification of the different species.

Mantra Gajah.

BY W. GEORGE MAXWELL.

In an article, which I contributed to the Society's Journal No. 45, and in which I gave a translation of a book of charms used by Malay elephant-drivers, I mentioned that I had in my possession another book of similar charms.

It consists of six sheets of stout paper, sewn down the middle so as to make a small book of twelve sheets or twenty-four pages. The outer cover has been stained a rich chocolate colour by the moisture of warm and perhaps not over clean hands and by the smoke of the fire-places over which the Malays keep, in hanging racks, the articles which they wish to preserve from damp. There is nothing in the book or on its cover to give any idea of its age, and Mat Jawi, the Assistant Penghulu of Kuala Plus, who gave it to me, could only say, in general terms, that it was old, and that it had been in his family for a long time. Mat Jawi is the grandson of the former Orang Kaya kaya Sri Adika Raja, and, as the book of which I have already given a translation is expressly stated to contain the hereditary lore "that has come down from the Datohs Sri Adika Raja unto the present day," it is only to be expected that the charms set forth in the two books should closely resemble one another. This book begins abruptly without an introduction of any kind, and ends even more abruptly by reason of the available space on the paper being exhausted. In the last line, the writer started to give a charm to soften the heart of an elephant, and then, seeing that he had no more paper, scratched it out, and scribbled under it "tamat" "the end."

I here reproduce the book in its entirety in "roman" characters. I have not attempted to edit it in any way, of such part of it as is Malay no translation is necessary, and of such part of it as is not Malay I am unable to give a translation. I am inclined to think that the non-Malay charms are nothing but a corrupt form of Siamese, and to ascribe to them a much more recent period than I had suggested in my first article.

It is impossible to say when the Siamese first came down the Peninsula in search of elephants. Their own country has always been richly stocked with elephants; and at this day, from all accounts, there roam through the forests, in a semi-wild condition, herds of these great animals for which there is little or no commercial use. It is unlikely, therefore, that the Siamese should, at any early period, have gone far afield in search of animals for which there was but little demand in their own country; unless, of course, the search was one that was being made for the sacred white elephant.

It was perhaps not until the development of India and Burmah caused a demand for elephants for state ceremonies and for business purposes, and created a trade between Siam and these countries, that the Malay Peninsula was laid under contribution to supply elephants.

This trade in elephants was particularly referred to by Gemelli Careri, who in 1695 went from Goa to Malacca. He wrote in his "Giro del Mondo" (Vol. III. pp. 358, 359) an account, which is translated in Churchill's Voyages, Vol. IV. p. 284, as follows:—"all the country of Malacca, Cambaya "Siam, Ciampa, Cocincinna and Tunchin abounds in elephants "of which the Siamese particularly make a great trade, carrying them by land to the opposite coast and port of Tenazarin, belonging to the King of Siam, near the Gulf of Bengala, "where merchants buy to transport them by sea into the "dominions of Mahometan princes."

The extent to which this trade in elephants grew is shewn in the records of the India Office. The following notices of ships with elephants arriving at the port of Masulipatam, from Tenasserim alone, are taken from the Diary and Consultation Book of that factory.*

April	25	1680	A	ship	with	elephants	
May	3	1680	A	ship	with	16	,,
April	21	1681	,,	,,	,,	13	,,

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* Anderson's "English Intercourse with Siam in the Seventeenth Century" p. 20.

Feb.	21	1682	,,	ship	with	15	elephants.
Feb.	22	1682	,,	,,	,,	15	,,
Feb.	22	1682	A	,,	,,	11	,,
April	20	1682	,,	,,	,,	6	,,
April	22	1682	,,	,,	,,	4	,,
March		1684	Two	ships	,,	46	,,
April		1684	A	ship	,,	12	,,
April		1684	,,	,,	,,	20	,,

The Siamese who ransacked the Malay Peninsula to supply this surprising demand for elephants probably used the *Mantra Gajah* that are recorded in these manuscripts. But whether it was in the Seventeenth Century that the Malays learnt these *Mantras*, or whether their acquisition of this lore dates from a period before it or after it, can, until further information on the subject is forthcoming, only be matter for conjecture.

Mantra Gajah.

Bab ini hendak tiup tentang atau di-bacha pada batu di-limpar-kan pada gajah itu.

Ini-lah di-kata-nya

Om kundanga ding kundanga sai teluwang tekulin dipintai rambut teluling di-hadapan tibalulon kakanan tibalulun kakiri sikab piah nenek-mu.

Hai gajah aku tahu asal angkau mula menjadi,
Merkubulia ka-mulia asal mu,
Kau turut kata,
Jika tiada turut kata ku,
Mati di-bunoh Sri Rama;
Jika angkau turut kata ku
Di-hidupi uleh Maha Risi. Kul.

Ini melembut-kan hati gajah di-bacha pada tebu tiga krat Ini-lah kata-nya,

Om darang muka-nya darang darang lang-li muka-nya langli telon changku kan kusa mu hati-ku akan chucha-mu lidah kau akan sangkal mu tendurong kakanan tenduron kakiri tundok chinta kapada aku puah rab.

Bab ini buang hantu rimba. Ini kata-nya.

Om berang berat pikat pikau rambin perai siah pindah leku turun luwai hantu rimba puah rengab. Pada tiga likur bulan Safar pada hari malam khamis, ini pematah hati gajah barang biut-nya mau katahui asal-nya kata-nya.

Hai Adam lemit aku tahu asal mu,
Allah Tuhan mu,
Nabi Muhammad penghulu mu,
Siti Hawa nama ibu mu,
Nan Pachi nama mu,
Jusan nama aku,
Jangan angkau derhaka pada aku,
Jika angkau derhaka kapada aku,
Sarupa angkau derhaka kapada Piarawan.

Fasal pada menyata-kan segala ubat penyakit gajah. Pertama ini ubat besar deripada Pijang, pertama ambil akar pesambu dan daun-nya, dan pesambu kayu ambil akar-nya, dan daun-nya, dan akar chanerai hitam, dan akar chichir, dan akar pianggu, dan akar pulai, dan akar rotan dini, dan akar rotan tetawar, dan akar tutop bumi, dan akar panggai panggai, dan akar jerun, dan akar kuchai, dan akar gelenggang, dan akar kedudok dan akar paku, dan akar tambun tahi, dan akar temu.

Bab ini patih kusa; ambil daun kekiat segenggam, herat gosokkan pada kapala gajah dengan kusa-nya sakali.

Bab ini ubat tuai, maka ambil sampah yang lekat kapada kayu yang ter-gerak-gerak di-ayer itu, maka per-habu harang buboh minyak, maka sapu-kan pada ekor gajah itu.

Bab ini ubat gajah tiada mau bernang, maka ambil kiambang, maka per-habu harang buboh minyak maka sapu-kan kapada gumba-nya, dan piah-nya kiri kanan.

Bab ini ubat gajah tiada mau tidor di-ayer maka ambil lumut yang lekat di-pangkal-pangkal prahu orang, maka per-habu harang maka buboh minyak, maka sapu-kan pada gumba-nya dan piah-nya kiri kanan.

Bab ini ubat membuang geli gajah, maka ambil ulun merah sa-genggam herat, maka gosokkan kapada gumba-nya, dan piah-nya kiri kanan.

Bab ini ubat gajahiya-itu maka ambil daun labu yang naik pada rumah orang, maka mengambil dia itu churi jangan di-tahu uleh tuan-nya, dan timba perigi orang itu pun churi juga, maka per-habu harang maka bubok minyak gosokkan pada belalai-nya.

Bab ini ubat pelambut hati gajah, maka ambil asin asin sa-genggam herat, maka gosokkan pada piah-nya kiri kanan.

Bab ini ubat orang kena chemahang, maka ambil getah merbau yang muntah-kan darah ambil dengan tanah-nya sakali dan chemara putri dan mempalas dan ayer buku kayu dan ayer kubang babi, maka ramas sakelian-nya itu maka limau-kan kapada orang yang kena chemahang itu 'afiat uleh-nya.

Bab ini ubat gajah kena kesar api ambil akar jenjuang merah dan ambil umbut tebrau dan daun limau nipis dan maswi bawang merah kunyit terus dan lada sulah, maka mamah dengan sirih pinang, maka sembor tujoh petang 'afiat.

Bab ini ubat gajah kesar ambil akar bunga raia dan akar jerangau mamah dengan sirih pinang sembor tiga petang 'afiat.

Bab ini ubat gajah sakit perut chirit, ambil kulit pauh dan buah asam jawa, dan kulit kebantong dan kulit jambu ayer, dan kulit sena dan langkinang atau kulit-nya sakelian-nya itu di-tumbok lumat-lumat beri makan gajah itu serta dengan garam siam 'afiat.

Bab ini ubat gajah makan tanah, ambil chaching dan tanah lembah; ada pun chaching itu di-rendang dahulu sudah itu champur dengan tanah lembah itu, makan beri makan gajah itu tiga petang 'afiat.

Bab ini ubat gajah bengkak kaki-nya atau tuboh-nya, ambil halia dan kunyit dan limping dan kunyit terus, maka giling lumat-lumat buboh garam siam maka hangat-kan pada api chamur-kan kapada gajah itu barang tiga petang 'afiat.

Bab ini ubat gajah ter-salah, ambil daun gelenggang dan daun raminggu dan daun asin, asin semua-nya itu rendang kring kring buboh minyak buboh di-dalam tempurong hangat-kan pada api, maka chamur-kan pada gajah sakit itu barang tiga petang atau tiga hari 'afiat.

Bab ini ubat hendak beri gemok, ambil kulit badak dan garam siam maka rendam-kan kulit badak itu dan garam siam itu kapada ayer madu, maka beri minum gajah itu barang tiga hari.

Bab ini ubat gajah hendak gemok maka ambil buah pedindang dan garam siam, maka rendam-kan pada ayer madu beri minum gajah itu barang tiga hari.

Bab ini ubat tiada mahu trum, maka ambil akar kuchai yang jantan makan dengan sirih pinang sembur kapada segala siku gajah itu barang tiga hari.

Bab ini ubat gajah mata ber-ayer, maka ambil buah mating bakar hangus hangus, maka asah dengan ayer limau nipis, maka buboh pada mata gajah itu.

Bab ini ubat tiada patih kusa, ambil amas dan perak dan tembaga dan besi, maka rendam pada ayer maka mandi-kan kapada kepala gaja itu serta dengan kusa-nya barang tiga hari.

Bab ini ubat membunoh segala penyakit di-dalam perut gajah, maka ambil terong perat yang masak dan lengkuas padang dan garam siam dan kulit melak, maka kita belah terong itu dan lengkuas itu tumbok lumat lumat maka kita buboh di-dalam tebu atau pisang, maka kita beri makan gajah itu barang tiga hari.

Bab ini ubat gajah melenggang, ambil akar gelenggang dan akar terong asam, maka makan dengan sirih pinang sembur-kan kapada gumba-nya dan pipi-nya kiri kanan lalu pada buah anchar-nya kiri kanan barang tiga petang.

Bab ini ubat pengasih gajah yang liar akan gajah jinak maka ambil akar tutup bumi maka kita makan dengan sirih pinang, maka kita semburkan kapada dahi gajah kita dan gumba-nya dan pipi-nya kiri kanan dan telinga-nya maka lepas-kan-lah gajah kita itu.

Bab ini ubat gajah kena kesar ayer, ambil jenjuang puteh umbut-nya dan kulit bonglai dan kunyit terus, maswi bawang merah dan lada sulah, maka sembur saperti dahulu juga.

Bab ini akan jarang karang ambil buah kabong dan pisang benggala dan umbut chiru maka tumbok lumat lumat rendam di-dalam pasu jaram-kan kepala gajah itu. Ini-lah mantra-nya

Om kat ti-u tawi sak.

Bab ini ubat gajah beri pulang sendiri, ambil tungku rumah orang tinggal dan tangga-nya dan bendul-nya maka beri makan gajah itu dengan tebu barang tujoh hari.

Bab ini ubat kena besir, ambil kunyit terus hitam dan puteh, dan tanah lembah yang hitam dan umbut terau, maswi, bawang merah, lada sulah, maka masok kapada tebu atau pisang maka beri makan.

Bab ini ubat gajah hendak gemok ambil temakol dan pusat buaia beri makan gajah itu di-dalam ayer hingga lembong perut-nya serta garam siam dan kapada bulan tiga-belas atau lima-belas sudah-nya temakol dengan kulit buaia itu jemor kering kering.

Bab ini ubat gajah tiada mahu makan maka ambil lengkuas dan akar pisang pisang tumbok lumat lumat, maka beri makan serta garam siam.

Bab ini ubat gajah hendak gemok, ambil patawali dan akar terong perat dan akar terong pipit dan akar terong asam dan akar mentajam chinchang lumat lumat serta garam siam rendam kapada bekas, maka beri minum gajah itu. Sabagai lagi ubat gajah gemok ambil jenjuang besar dan jenjuang puteh dan akar betik dan akar mentajam, maka beri makan serta garam siam.

Bab ini ubat gajah sejuk kena penyakit, ambil akar terong asam dan akar rotan dini dan akar chekor jerangau dan akar jenjuang merah dan akar kunyit terus dan bawang merah lada sulah, makan dengan sirih pinang sembur kapada selerah tuboh gajah itu.

Bab ini jika gajah kena sakit hangat ambil daun tetawar dan akar nior dan akar tebu betong dan akar jenjuang puteh dan akar chiru dan akar rotan tetawar mamah dengan sirih pinang sembur selerah tuboh gajah itu.

Bab ini ubat gajah kesar ambil buah kayu yang lekat pada pasir merah warna-nya, beri makan serta garam siam barang tiga hari. Danlagi ubat kesar ambil daun sunting hantu dan daun mentajam dan daun pinang tumbok buboh kapor tuhor bedak-kan pada tuboh gajah itu barang tiga hari.

Bab ini ubat membunoh biar di-dalam perut gajah, maka ambil sendawa dan jemuju kharsani beri makan gajah itu 'afiat.

Bab ini fasal pada menyatakan nama penyakit gajah.
Per-tama-tama, jika bengkak hujong belalai gajah itu,
Mersud nama penyakit,
Dan jika bengkak di-bawah dagu-nya,
Merchun nama penyakit,
Dan jika bengkak gumba-nya,
Mertab nama penyakit,
Dan jika bengkak mata-nya,
Mer-ka-but nama-nya,
Dan jika bengkak pada telinga-nya,
Keron nama penyakit,
Dan jika bengkak di-dalam perut-nya,
Merpun nama penyakit,
Dan jika bengkak pada supek karong atau shahwat-nya,
Mertemu nama penyakit,
Dan jika bengkak sabelah kaki-nya,
Mernu nama penyakit,
Dan jika bengkak kedua kaki-nya,
Maratalum nama penyakit-nya,
Dan jika bengkak jubor-nya,
Merchap nama penyakit-nya,
Dan jika bengkak hujong ekor-nya,
Merpahat nama penyakit-nya,

Dan jika bengkak belalai-nya, ubat-nya ambil daun langkudi dan daun peria, daun labu kentang, dan tahi lembu, kapor tahor dan garam semua-nya itu pipis lumat lumat tampalkan pada bengkak itu,

Dan jika bengkak gumba-nya itu,
ambil kulit remunggai dan kulit dedap dan kulit lemping dan kunyit terus dan lengkuas padang dan limau nipis, maka tumbok lumat lumat, maka rebus hangat sapu-kan pada gumba-nya, dan bengkak di-bawah dagu pun ubat ini jua. Dan lagi ubat bengkak mata-nya maka ambil kulit lembu dan kapala arak dan daun peria dengan akar-nya dan daun langkudi dengan akar-nya dan daun labu gantang dengan akar-nya, maka bakar kulit lembu itu hangus hangus sakelian-nya itu tumbok lumat lumat champur dengan kapala arak, maka bubohkan kapada yang bengkak itu neschaya semboh uleh-nya, dan

jika gajah bengkak telinga-nya maka ambil buah asam jawa dan buah limau kerbau, limau purut, limau manis, limau kerat lintang, maka sakelian itu ambil daun-nya dan akar-nya chinchang lumat lumat rebus kapada api, maka tuang dengan hampas-nya kapada bengkak itu barang tiga hari.

Bab ini pada menyatakan laksana gajah,

Jika ada gajah itu ber-jalan saperti lembu ber-tuah gajah itu,

Dan jika gajah itu ber-jalan saperti kuda atau pelandok gajah itu ber-tuah.

Fasal pada menyatakan tuah gajah,

Apabila gajah itu mengerab telinga-nya ber-temu di-hadapan dan belalai-nya sampai ka-tanah dan gading-nya dekat dengan tanah selak nampak-nya lima lapis atau tiga lapis kuku-nya dua puloh, dan shahwat-nya sampai ka-tanah, dan ekor-nya sampai ka-tanah gajah itu chalaka.

Bab ini pri menyatakan chelaka gajah,

Jika hitam langit-langit gajah itu atau bukor lidah-nya chelaka.

Atau yang kelong gajah itu bidak dua belas chelaka-nya

Atau kuku-nya anam belas,

Atau ekor tiada gajah itu chelaka.

Atau bidak di-bawah dagu-nya rupa-nya merah,

Atau di-telinga-nya gajah itu bidak chelaka,

Atau di-bawah perut-nya bidak chelaka

Atau ekor-nya yang helong tiada baik.

Bab ini pri menyatakan kapada masa iya makan atau minum jangan di-sembur-kan-nya biar-lah dengan per-lahan lahan juga, jikalau ada lebih di-makan-nya itu di-letakkan-nya di-hadapan-nya gajah itu baik.

Bab ini pada menyatakan bangsa gajah,

Per-tama-tama, Mersan nama-nya gajah itu tinggi-nya dua belas hesta, akan bangsa gajah itu deripada Membang.

Jika tinggi-nya anam hesta, bangsa gajah itu deripada Dewa,

Jika tinggi-nya lima hesta gajah itu, bangsa deripada Indra,

Jika tinggi-nya lima hesta gajah itu, bangsa-nya deripada Bangsawan, Jika tinggi-nya lima hesta, maka yang ter-sebut saperti di-dalam temrai nu 'aini tarong sikan.

Jika gajah itu gading-nya angkat sabelah kanan gajah itu mata-nya puteh gajah itu ber-tuah.

Dan jika gajah itu bulu ekor-nya puteh gading-nya angkat sabelah kiri gajah itu tiada baik. "Finai" nama-nya.

Jikalau gajah itu gading-nya angkat sabelah kanan, "Tink" nama-nya gajah itu, tetapi baik.

Jikalau gajah itu hitam gading-nya dan sabelah puteh, chelaka gajah itu.

Ada pun gajah yang baik gading-nya puteh kadua.

Bab ini kita hendak menarek tunggal,

Jika tunggal itu tiada mahu mengikut, ini-lah mantra-nya, maka ambil tanah tiga kepal, atau barang yang patut dapat di-makan gajah itu, maka mantra-kan dengan mantra ini, maka di-lontarkan kapada gajah itu. Ini-lah yang di-bacha-nya,

Ma-tapu chum-kan midun yoh ka-yau ambi kawan teng-wan wan pirak dut pirak situn duraja cham-kan lan teng nura ambi kewat tengwan wan.

Bab ini jika kita di-hambat tunggal. Ini-lah mantra-nya

Tut tahai chati chatang lipu tut hai.

Bab ini jika hendak menjerat gajah di-dalam hutan atau di-dalam kubu, atau membuka hutan atau kubu,

Ini-lah mantra-nya,

Am kanching kandui kaikitai karum kau chakan tang-langkan langka peryumaha pau Sidi-kan guru ombak batiya.

Bab ini kenaling kambing hutan, ini-lah kenaling-nya

Om yang chong bang dai bang tu bang ru bang tipal yang kemun kamaya om shar wa bang sidi-kan guru om buk batiya.

Bab ini ubat gajah supaya berani ber-juang maka ambil akar leletup dan akar panggil, maka tumbok lumat lumat buboh di-dalam tebu beri-kan gajah itu makan barang tiga hari neschaya berani uleh-nya.

Bab ini jika gajah itu cherdek, pertama ambil kulit remunggai dan kulit asam jawa dan buah-nya yang masak ambil ayer limau nipis dan ayer tebu, maka buboh di-dalam rumput beri-kan makan neschaya 'afiat uleh-nya.

Bab ini ubat mantra suku,

Tima safaha charu s'osi ra ara saufa katu yash a sema kankha teru kiseru asam pintu.
Ada pun sakelian ubat itu, ini-lah jampi-nya maka di-hambuskan tiga kali.

Bab ini mantra membuang perai,

Om biranduk randai kaparai perai pundum nichampaling cham chik irak ku wan cham yut nacham-mu lang mu terung kuk miter muchang teping tau peria munteri puah,

Om chating ting chaketang telang kau chung-kan yet kuta yet kau naret terat tuanku suroh luloh lulai peyak tau ter u yerwon bat teha teraua biba yun tahom yaman changrai miok keta wie.

Bab ini membuang hantu kambing hutan,

Om bing bing bangtu bang dai bangti pada bang kamut meya om rengab serpa rengab.

Bab ini mantra perabun gajah,

Om pan pang maha pang pit om tau tau sahom siti kertana sahom om sauhom.

Bab ini perengab,

Om rengab chang rengab dzai rengab pitai piyat yakrom rengab per-yom apom rengab rungkang karamai rengab pada payaman pong om rengab maha rengab sidikan guru om bok batiya.

Bab ini mantra gajah naik rengka

Om pat maha pat chailaku pat kuru hei mihan changrai mayu tani.

Bab ini mantra mengarang-kan tali rotan

Om kan kat changra mau kau ikat pekarangku.

Bab ini jika menjerat gajah yang besar, maka di-tahan sidin itu maka di-sembur dengan kunyit terus kemdian di-kunchi-kan mata sidin itu. Ini-lah mantra-nya.

Om yok bat kau chabat diran dai bau bangkat chang pacha nangkrai om maha risi si bok katarak tanta pongtala cha nangai aurab rab perakamtu rengab, maka lalu disembur-kan dengan kunyit terus lalu di-tahan.

Bab ini jika ber-kubu gajah bacha-kan kapada kunyit terus beri-kan kapada orang kubu itu suroh sembur-kan sakeliling kubu itu. Inilah mantra-nya, Ikrai min puni chi chana rak

Bab ini per-tahan tunggal. Ini-lah ubat

Tut kerar tut kanching kandai kanpatai tut hei.

Bab ini jika kita hendak masok gajah jinak, maka kawan ber-tunggal itu, maka bacha mantra ini tiga kali sa'nafas.

Om wi chit terui kambara ula sipu wah suwah suhom dai bang kembang tikada samkam.

Bab ini mantra bomo' yang kechil kechil, maka orang hendak menjerat gajah masok kubu, maka bomo' yang besar membacha mantra juga, maka bomo' yang kechil kechil pun membacha melepas diri-nya. Ini-lah mantra-nya,

Om kenaling chak chap chap kenaling rengab kenaling om chap kenaling suwah su hei.
Maka di-sembur dengan kunyit terus kakanan dan kakiri.

Bab ini perengab,

Om rengab chang rengab pai tai bakarom rengab pera yom apom rengab rengkong kangku ramai rengab pada peman pong rengab maha rengab sidikan guru ombok batiya.

Bab ini pelambai tunggal, maka ambil chamar maka patah paras mata gajah jinak itu. Ini-lah mantra-nya,

Ma tapu chomkan liyon tak chong ambi ya kasayok ombiya kawan chom-kan lisan tangku an pirak dos pirak siton nang makaru tangkuan.

Bab ini membuang hantu hutan. Ini-lah mantra-nya,

Om berah berom berah berai patari patarai patabuna ramiya tin shah pindah kau turun laui mur-tangan kamui kamailui.

Bab ini perabun pun jadi di-bacha masok hutan atau barang pilak tiada kita kena atau barang kerja kita.

Ini-lah mantra-nya yang di-bacha dahulu,

Om kenaling pajanaru pajanari saraba bangkom bangkak takabonting lai pat pachaupi bangkom bangkamanya turun kau pindah kahutan yang pana puah karab turun kapadang yang maha luas karimba yang maha besar.

Bab ini suatu kenaling.

Om kenaling perah pom perah pai patabu rasin marang salik samsatom sirapatom perpai tataban ting tui pat kau chat pai ai chakat tom bang tom turun-lah pindah kau kahutan pana puah kerab turun kan kapadang yang maha luas karimba yang maha besar.

Ini-lah kelamin-nya,

Om kenaling tang chandap kenaling ating kambakut kenaling yaku wah yanata baka parom peratang kenaling nai sitikan guru mu batiya rengab,

Bab ini mantra Raja Gajah, maka kita pergi kapada tanah kita kuais dengan tumit, maka ambil tanah itu kita mantra tiga kali sa'nafas, maka buboh kapada ubon ubon kita.

Ini-lah mantra-nya,

Om pan pang maka pang pit om tau sa hom sitikan tana sahom.

Bab ini hendak buka hutan. Ini-lah mantra-nya,

Om bik bik bang bang bangtu bangru bangti pada bang ka-muai maia om rengab sara para ngab.

Ini-lah kelamin-nya,

Om kanching kandai kun pitai naka nara nakaru pi pat chamdi kam ti pa man da puni sara perengab.

Bab ini penutup hutan. Ini-lah mantra-nya,

Om bang chang bangdai bangtu bangru bangti pada bangkemu kamya om bang sara para bang.

Ini-lah kelamin-nya,

Om rengab chang rengab undai rengab piti di yat bakarom rengab rakang lang kerahei rengab pada pai man pong am rengab maha rengab ombang chong bangdai bangtu bangru bangti pada bang kamu kamai am bang sarpa bang om rengab chang rengab dai rengab pitai pi yat bakarom rengab rakong lang karamai rengab pada pai man pang om rengab maha rengab.

Bab ini hendak ber-buat hikmat akan orang jangan ber-uleh menjerat gajah, maka ambil tanah bekas gajah jinak orang itu dan gajah yang hendak di-jerat itu di-perbuat akan gambar gajah, ambil daun kandan akan satam-nya, maka surat nama bomo'-nya dan nama gamala-nya pada daun kandan itu, sudah maka korek lubang sajengkal dalam-nya, maka tutop dengan papan maka tiup api di-atas-nya jangan padam padam. Ini-lah mantra-nya,

Am wi mata kamarah angkar aula sula chi puan sau hom suhom. Kelamin-nya

Am berah berom berai petari petarai pekuboran mi suti sah pindah-lah angkau turun kaui ui tatong kambi kamlai.

Bab ini mantra melambai tinggi lambai dengan chamar.

Ma tepu cham kan liyan dutang ching abiya keyak abiya kewan chum kan liyan tangkuan.

Bab ini mantra tunggal.

Am kasak kan terak hak chantek junsa nak selak setaha tikah wi serawi kak wi tera wapu taua ati yan nik mekurai techuntang kepurantai sura mamawi serawikak wi puru purak binat siyan tiga bulan naik siyan bulan turun.

Bab ini menahan kawan, maka keliling tiga kali.

Ini-lah mantra-nya,

Teru 'om ambi tan bimak lok tu wadin keluwi lok pik pitai lok mas yata yang kerai chandan kerai perok nangai tuan ti yang salok tan mu chaku chakkatom.

Bab ini mantra kapada tapak tangan kiri, maka gosok kapada telinga gajah yang kanan dan yang kiri.

Om chikan chichu samit palai a'itu rati duchang bayi duchang san bisai yi.

Ini tunggal atau kawan, ini-lah mantra-nya,

Tut sapera tut changlu mi changkan changsu mu kan chantang pera piyat sitikan kuru bati per-hai kalu hai.

Bab ini makan bomo'.

Pau bub yabub kindi judi tang-pong'ai malab miyaji janak kan pastak taru chai-ku kat cha king.

Ini-lah kelamin-nya,

Ter om pu wat om nya midak midong midak mi-kalang sata yang chadin karai paruk pangai lo'tu mu chak kan jakatom.

Bab ini buang hantu hutan,

Om kali miwah kacharai rai keli duk kalidan tera-yang kachang kanan sah pindah laui turun kau wi hantu kamsat kamya nyamihan changrai miyu katu wai.

Bab ini kepala segala mantra, maka barang suatu kreja, ini-lah dahulu di-bacha-nya.

Om kenaling kanalai kanaling tuk-ting kanaling nuk tai kut kut katakong kalai kamalut kuh kanaling takongkalai om sing kupasing changrai om sah kapasat changrai arah rah terong perat tijau beli turun ber-titi salah di-batang tuboh kau wi mitarau kau miloh sidikan kuruku batiya para-kan haikaloh kachat pi tukkami kau mipai lui sarapa changrai.

Ini-lah mantra Raja Ibrahim maka jika gajah itu sakit atau demam mantra-kan kapada ayer, maka mandikan kapintu kubu dan mandi-kan chelong pun.

Ini-lah mantra-nya,

Om patabu ramai san kau cha'an angkat matang pin pindan au kau kuklu mata changrai kachat pit ongpami kau miki lui sarapa changrai kau minan tara anglai sitikan guru-mu batiya om setaidai sati yudong sati karang kana parak yatu tuk sam diyak samdak sakala yak sakadong nai ong nong chakaran sib ang tong chakaran siyan ontong chaparat pat pat changrai oksaksi pataradi sarap chatarai matarang changrai kan miman ter englui situ-kuru-mu batiya.

Bab ini jikalau gajah sakit maka bacha-kan kapada ayer mandikan, atau kunyit terus sembor-kan petang petang.

Ini-lah mantra-nya,

Om pa paru paparai maha rasai sakunta parah Sri Rama per yit terang siti-kan Oh Maha Risi yak tamarahai parai' aurai awai dai madong sarpa angkan per-angkau sakang sakom sarapa rengab siti aku Rama batiya. Hu!

Ini-lah kelamin,

Om kenaling kanalai perah puat perah pai pata burasan materong chai salik sumtom karapatom per pai tut ban ting tui pat ka chat ai chakatom bangtom turun kau pindah kau kahutan pana puah karab turun kan kapadang yang maha luas karimba yang maha besar.

Kelamin-nya,

Om kenaling tang chandai pa kenaling ating kumalut biti kenaling yakut yanata baka parom parom paranang kenaling nai siti-kan guru-ku batiya rengab.

Bab ini perabun pun jadi dan lagi tetkala hendak masok hutan di-bacha barang kiblat tiada kena kapada kita.

Om kenaling paja narui serbabangkom bangkok tak banting tai pat pachan pai bangkam bangli pada somkom ting kamaia turun kau pindah kan kahutan pana puak karab turun kau kapadang yang maha luas karimba yang maha besar.

Bab ini buang hantu anak gajah, maka pukul dengan kosa jangan dengan mata-nya kapada anak gajah itu,

Am panirang panarak malachoh kau pindah kahutan pana puah karab turun kau kapadang maha luas karimba yang maha besar.

Kelamin-nya,

Om chawi chawat chawi chamarat malachoh kau pindah kahutan pana puah karab turun kau kapadang yang maha luar karimba yang maha besar komya maia.

Ini perabun gajah tiada mahu masok chelong maka bachakau kapada kunyit trus sembor kapada chelong.

Om kaling yating tamdit batka lingkit salik santom am kamin kar kau lasantom.

Kelamin-nya,

Om chau samin samin plai ranghai tamku lamipaina tau kalim parak nak tuah tawanta.

Bab ini menahan kawan atau tunggal masok kawan jinak maka kita patah kayu delapan jarang lebar keliling kawan atau tunggal itu.

Ini-lah mantra-nya,

Puntang pakachakak tamang pakachakak sangkong pakachakak.

Ini-lah kelamin-nya,

Ara hak aro puhon kau mihai umok dun au mihai mangwa au mihai mang hincha ok chong pak hukdab tang chakang changma lamatong chun sini karong chong put nak omdib.

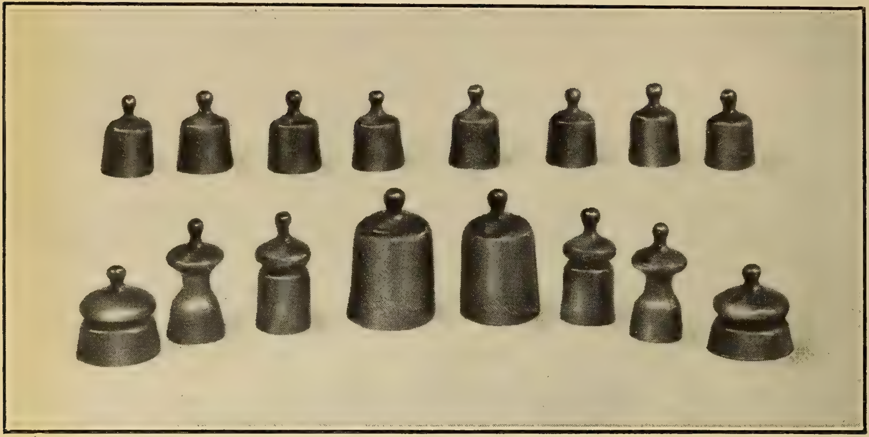
Ini membuang hantu rimba.

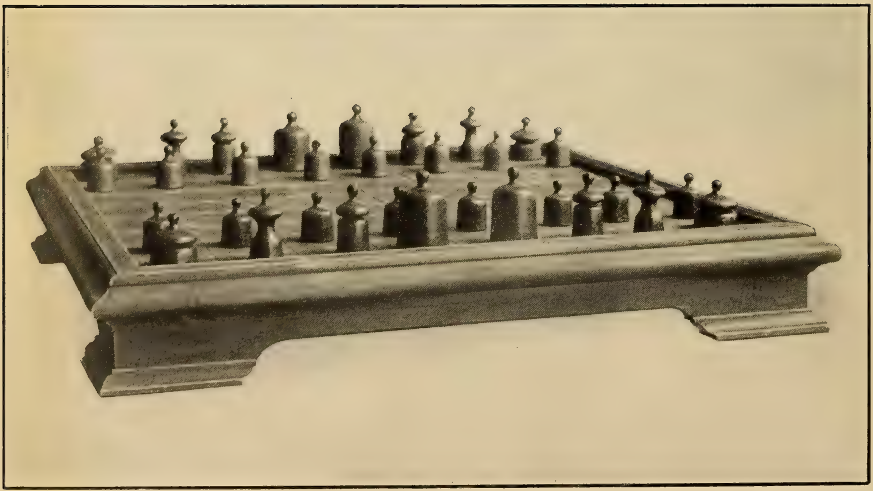
Ini mantra-nya

Am kenaling kanalai pajanaru saraba bangkom takbun tau pat kut chat pai ngaban kom bangti pada saiekom salik suttom mada chak kau turunlah wi kahutan pana karimba yang besar puah rengab. Temat.

* * * *

Here the manuscript ends. I ought in conclusion to say that I have made no attempt to alter, in the hope of amending the spelling: *Sidikan* and *sitikan*, *guru* and *kuru* (to take examples) are in every case exact transliterations.





MALAY CHESS-BOARD AND MEN.

Malay Chess.

By T. B. Elcum.

I have seen few things so amusing as a game of chess played in a Malay village, with the whole population of the village standing round, and all of them who possess even the most rudimentary knowledge of the moves, "assisting" their champion with vociferous advice, and abusing his stupidity when he makes a move which for some reason, generally entirely wrong, they think inferior. The rule of "touch and move" is not generally observed among Malays. The spectators frequently will seize upon a piece which has been moved, replace it and make another move, pointing out how superior their method is. Very frequently the suggested improvement is absolutely futile, putting a piece "en prise," or offering an obvious mate to the opponent, but the suggestor is quite unabashed when this is pointed out to him, and the fire of advice and remonstrance goes on until the game is over.

The appliances for these village games are generally of a very primitive character. There will be probably a rough hand-made lot of pieces, perhaps all of one colour, and a hand-made board. The squares of the board are never marked in different colours. Probably some of the men are missing, and various substitutes have to be provided; and sometimes there are no pawns, and their place has to be supplied by little stones, or bits of leaf.

Sometimes the pieces used by Malays bear more or less resemblance to the shapes with which we are familiar, except that the *tir*, the rook, is generally a flat piece like a draughtsman. But more usually they are much less distinctive in shape. The illustrations show a handsome set, gold and brown, kindly lent to me by one of the Johore Royal Family. It will be noticed that the board is uncoloured; the king, queen and pawns are all of the same shape, and distinguished by size only.

Jour. Straits Branch R. A. Soc., No. 49, 1907.

The rooks in this set are not of the usual flat description. As a rule the carving of the pieces is very rough, and it is seldom that one sees an elaborate set like that here illustrated. A set often suffices for a village. It is difficult to procure a genuine set of Malay chessmen.

In some parts of the Peninsula very few Malays play chess, in others a large proportion of the inhabitants. On the whole the proportion of men who can play chess more or less is probably greater than with most races. The same game is played in Sumatra as in the Peninsula, and I believe also in Borneo.

How the Malays acquired the game is a mystery. They may have done so from the Arabs, or they may have learnt it directly from natives of India. Neither the peculiar rules of the game, nor the names of pieces and terms used in play throw any light on this point. I give at the end of these notes a list of the words most commonly used in the game, and the languages from which they are derived, as given in Wilkinson's dictionary. The Sanscrit words seem as likely to have come through the Arabs, who learnt the game from India, as direct. Nor do Malay records shed any light on the way in which the game was introduced, so far as I have been able to discover. The most interesting points about the game are the similarities to, and the differences from, the game as now played in Europe, and as formerly played.

The board is 8 by 8 as in European chess, and the men except for the modifications to be pointed out, have the same moves and powers. They are the King (*raja*) the Queen (*mentĕri,* minister), two Bishops (*gajah,* elephant), two knights (*kuda*, horse), two Rooks (*tir*, a name which appears to have no other meaning), and 8 pawns (*bidak*, also only the name of this piece).

The first great difference between the Malay game and ours, and one which entirely upsets all book knowledge of the openings which may have been acquired by a student of our game, when he attempts to play the Malay game, is in the arrangements of the pieces. With us king stands opposite king and queen opposite queen. In Malay chess the mentĕri stands on the right of his king, and is so opposite to the opposing king.

In the early days of European chess occasional modifications appear to have been made in the position of the pieces at starting, before the game had settled to its present strict form. I have not seen any mention of the Malay method of arranging the men, but we read of games starting with a "tabiyat" or battle array, which seems to have taken may forms, in which the pieces were arranged in positions quite different from the normal starting arrangement and it is probable that the relative positions of king and queen were not always in early days entirely settled.

However that may be, the next variation between Malay chess and ours is certainly a survival of a rule, now dead, which prevailed at one time in Europe.

The Malay king, provided he has not been checked or moved, has the privilege of once leaping like a knight, or of moving over two squares whether another piece intervenes a not, laterally but not forward or diagonally. He can thus practically castle, but in two moves instead of one. Castling as we know it is not a part of the Malay game.

The "king's leap" was recognised in Europe in mediaeval chess before the present method of castling was generally adopted.

The results of this power of the king are very disconcerting to a player unused to the Malay game. Thus an unguarded knight giving check can be taken by the king, or in a crowded position the king skips away from an otherwise fatal check by a knight's move or over another piece. In playing Malay chess at first, it is very common to overlook this curious privilege of the king. The Malays frequently give what would otherwise be an aimless check in order to deprive the king of this power. I have not played the game sufficiently to be sure whether it would be generally advisable to do this between even players—whether the loss of one or two moves involved in giving the check is made up for by the king's loss of his privilege. But it is certainly advisable for a European skilful at his own form of chess, but a novice at Malay chess, to endeavour to force the king to move only in the way to which he is accustomed, even at the loss of a little time.

A pawn is taken "en passant" at Malay chess, as with us. That a refinement of the game such as this should exist among a primitive race is curious, but it is well established.

The rules of the game mentioned so far contain nothing which might not have been naturally developed from the same form of the game which produced chess as now played in Europe. The curious rules in force among Malays with regard to the promotion of a pawn appear to be peculiar to Malay chess only, and to have no parallel, so far as I can discover, in other forms of chess, ancient or modern.

In Europe any pawn reaching the eighth rank can at once become a queen or any other piece at the option of the player. In Malay chess a rook's pawn, so reaching the 8th rank, may become a mentĕri or any other piece immediately, except that it can only become a piece which is off the board; it cannot become a mentĕri if the mentĕri has not been taken. Should, however, the pawn so advancing to the eighth rank be on any other file, it does not acquire the privilege until it has played back diagonally a sufficient number of moves to enable it to reach the rook's file. Thus a pawn reaching knight's eighth has to play back diagonally one square, on reaching bishop's eighth, two squares, and on king's or queen's eighth, three squares. It is not necessary to actually play the pawn to the rook's file, but it must play back sufficiently far to have reached it. This curious rule makes winning by the odd pawn more difficult that in the European game.

There are other rules which tend to make it easier for the weaker force to draw. The king if left alone on the board must be mated in not more than seven moves or the game is drawn. When the stronger force is barely sufficient to mate, or the position is such as to make it difficult to mate in a few moves, Malay players of the weaker force frequently try to force the capture of these last remaining pawns or pieces, in the hope of escaping defeat by this rule.

Mate cannot be given by a discovered check. It is not good form to exchange queens unless the game can be immediately won or saved by doing so. A prejudice against the exchange is very common amongst beginners in Europe. There is, of course, no reason for this, but in Malay chess there is some. The rules as to queening a pawn, and as to the lone king make it so difficult to win a pawn ending that it is seldom advisable for the stronger force to clear the board by exchanges.

These rules, which make it easier for the weaker force to draw, are to my mind a weak point in the Malay game, which otherwise is probably equal in essentials to our own. It is certainly a pleasant change to play a game in which no openings have been analysed, and in which the player has to rely entirely on himself from the very beginning of the game.

Malays generally open with a fianchetto to avoid exposing the king to an early check. Whether this is the best method of beginning I cannot say. Few Malays are really strong at the game, though a considerable number play respectably.

The point of most interest with regard to the game is how the special rules which differ from those of other forms of chess, were evolved—whether they are a survival of the form of chess originally taught to the Malays, or whether they have been invented by the Malays themselves.

Terms commonly used in Malay Chess.

English	Malay	Derivation according to Wilkinson's Dictionary.
Chess	Chator	Sanskrit (chaturanga)
Chessmen	Buah Chator (Bauh = fruit)	
King	Raja	Sanskrit
Queen	Mentĕri (Minister)	Sanskrit
Rook	Tir	
Bishop	Gajah (elephant)	Sanskrit
Knight	Kuda (horse)	
Pawn	Bidak	Arabic
Check	Sah	Persian

English	Malay	Derivation according to Wilkinson's Dictionary.
Mate	Mat	
Draw	Sĕri	Sanskrit
To take	Makan	
To take "en passant"	Makan bidak suap. (suap = mouthful or bribe)	

The origin of "tir" is doubtful.

The words "buah," "kuda," "makan." "suap," are probably pure Malay.

"Mat" apparently comes from the same source as "Sah." If "Sah" is derived from the Persian, so probably is "mat." "Sah Mat" may mean "the king is dead."

Note on the Malay Game 'Jongkak.'

BY M. HELLIER.

I lately obtained, and sent to the Raffles Museum for exhibition, the playing board and seeds for the Malay game "Jongkak."

Haji Othman the Visiting Teacher of Province Wellesley, from whom I obtained the board, describes Jongkak as a women's game originally played by the ladies at the courts of the Malay Rajas. The playing board is shaped like a junk or boat, and, according to Haji Othman, the name of the game is derived from "jong" a junk. The board has 7 holes on each side, with a larger hole or compartment at each end.

The game is one for two people and is usually played with Tamarind or other seeds, but marbles are now sometimes used. Each player has one "village" (kampong) or row of holes, and in each side hole she places 7 seeds. The board is then ready for play.

The players start together. Each player taking the 7 seeds from the hole on her right and carrying them from right to left, drops one in each hole, the last seed falling into the large hole at the end. This seed is said to have "entered the house" (naik rumah) and this house belongs to the player on whose left it lies.

Each player then takes all the seeds from any one of the other holes in her "village" and moving as before from right to left around the board again drops a seed into each hole, taking care to drop one into her own 'house' but none into her opponent's.

Should the last seed fall into an empty hole the player is dead (mati), and must wait until the other player is 'dead' before she can again play. If this hole is in the player's own "village" any seeds in the opposite hole on her opponent's side may be taken and put into the "house." This is said to be (?) "a sacrifice" (mati béla).

When the last seed falls into a hole in which there are other seeds, these are taken and the player continues in play, and should the last seed fall into the player's "house" she also continues in play, taking the seeds from any hole in her "village."

When no more seeds remain in a player's "village" she is said to be "once defeated" (kalah sa-papan). She may however, take any seeds there may be in her "house" and place them again in the holes in her "village" putting 7 in a hole as before. Should any holes be left empty they are called "ruined wells" (telaga burok) and the player owning "ruined wells" must wait until her opponent is dead before playing again.

The game goes on in this way until a player has lost all her seeds. She is then "utterly destroyed" (mati kena abu). Skeat, who calls the game "chongkak," gives a short description of it in his "Malay Magic."

Concerning some old Sanskrit Inscriptions in the Malay Peninsula.

BY PROFESSOR H. KERN.

Extract from 'De Verslagen en Mededeelingen der Koninklijke Akademie van Wetenschappen.' Division 'Literature' 3rd Series. Part I. *

To complete my former communications in these pages upon the history of writing in the Indian Archipelago, I now desire to consider some inscriptions in the Malay Peninsula. Of these inscriptions, discovered by Colonel Low and published by him in facsimilé, one only has come down to us perfect; the rest are very fragmentary.

The first inscription was found in Kedah. It was engraved on a stone—a kind of slate—under the floor of a ruined building which had once measured ten to twelve feet square. This circumstances together with the contents of the inscription lead us to suspect that the building may have been the hut (kuṭi) of a Buddhist monk. A transliteration and translation of the inscription were published by J. W. Laidlay in the Journal of the Royal Asiatic Society of Bengal XVIII 247 (1). Although this gentleman who was at the time of the publication Secretary of the Asiatic Society has noticed the chief points in the inscription which call for comment, I give my own transliteration of it which differs in a few minor points from his. It runs thus:—

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* *Note.*—This translation is published with Professor Kern's permission.

(1) The facsimile on plate X. (This paper and plate are republished on pages 232-234 of Volume I of 'Miscellaneous papers relating to Indo-China' reprinted for the Straits Branch Royal Asiatic Society London 1886).

Ye dharmmâ hetuprabhavâ teshâ (ṃ) Tathâgato (hy avadat)?
Yeshâ (ṃ) ca yo nirodho eva (ṃ) wâvi Mahâçramaṇa (ḥ)
Ajñâc cîyate karma (*sic*) jenmana-karma kâraṇam
Jñânân na kriyate karmma (*sic*) karmâbhâvâ (n) na jâyate

The first couplet in halting âryâ-measure is the well known Buddhist creed-formula and need not detain us. The second in Anushṭubh can be translated thus:—

'It is through lack of knowledge that the *Karma* (2) accumulates. The *Karma* is the cause that men must be reborn. 'Through knowledge (of the nature of things) it comes about 'that men effect no (more) *Karma* and from the absence of '*Karma* it follows that men need not be born (again).

The idea expressed in the couplet is by no means exclusively Buddhistic but seeing that it follows immediately after the better known formula there can be no doubt that the sentence must be regarded here as the profession of faith of a disciple of Sâkya. We shall find the same phrase further on in another and indubitably Buddhist inscription from Province Wellesley. Elsewhere in British India and in Ceylon it is usually another sentence which we find coupled with the formula *Ye dharmâ &c.* I mean the couplet in Dhammapada stanza 183 (edited by Prof. Fausböll).

Sabbapâpass' akaraṇam kusalass' upasampadâ
Sacittaparyodapanaṃ, etaṃ buddhâna sâsanaṃ.

i. e. to refrain from all evil, to apply oneself to the good, to purify one's heart: that is the bidding of the Buddhas (the wise).

The couplet runs thus with a slight difference in the halting Sanskrit of Tibet:—

Sarvapâpasyâkaraṇaṃ, kuçalasyopasampadaṃ

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(2) *i. e.* the sum of good and evil actions which is the cause of man's remaining shackled to life and unable to escape from incarnation.

Svacittaparidamanaṃ, etad buddhânuçâsanam (3)

Between the two formulas *Ye dharmâ &c.*, and *Sarvapâpasya &c.*, there is no more necessary connection than between the former and the sentence *ajñânâc cîyate &c.* There is therefore nothing strange in finding as the second couplet first the one sentence and then the other (4). The second inscription in which the couplet *âñjânâç &c.*, is found, was dug up by Colonel Low in the North of Province Wellesley (5). The inscribed stone seems to have been the upper part of a column. On a copy of this ancient record which was published in 1835 without any explanation (6) can be seen the representation of a stûpa, the under part of which is formed by a sphere and not as usually by a hemisphere. Above the sphere rises a row of so-called umbrellas. On either side stands a line of writing. On the right side can be read:—

Ajñânâc cîyate karmma janmanaḥ karmma kâraṇa (m)

Of the writing on the left side I can only make out the word *jñânâ* (7) Fortunately what is left is sufficient proof that the inscription, apart from certain differences in spelling, is identical with the second couplet on the Kedah stone. That stone reads *janmana* with a 'Jihvâmûlîya' whilst the inscription on the pillar spells the same words with a 'visarga.'

Besides this two-lined verse the pillar has also another inscription along the edge. Beginning from the top on the right-hand side we can recognise the inscription given in facsimile on Plate IV in the Journal of the Royal Asiatic Society of Bengal XVII 2 and numbered 8 (8) It runs:—

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(3) See Csoma Körösi in J. As. Soc. B. IV 134 Cp. Spence Hardy Manual of Buddhism 198.

(4) Already noticed by B. H. Hodgson in J. As. Soc. B. IV 211.

(5) J. As. Soc. B. XVII 2, 64 (Misc, Papers relating to Indo-China. Vol. I. 223-226).

(6) J. As. Soc. B. IV pl. III.

(7) On the facsimile No. 10 on Pl. IV of J. A. S. B. XVII 2 the second line is almost entirely missing.

(8) The transliteration and translation given by Babu Rajendralal Mitra bear little resemblance to it.

Mahânâvika-Buddhguptasya Raktamṛittikâvâsa.

i. e. of the eminent shipowner Buddhagupta, resident at Raktamṛttikâ (9). The words following these cannot be made out with certainty, possibly *sya* (sign of genitive) *dânâm* (gift) or *deyadharmah* (pious donation). Even less can we decide if anything was written on the broken foot of the pillar.

On the left hand side beginning at the top we read—Sarvveṇa prakârena sarvvasmât sarvvathâ sarvva—Then follows a gap until at the end of a second line we see:—

Siddhayânâsanna.

What is left of the first line can be translated word for word: 'In every way, from every thing, in every respect, all'... *Siddhayânâsanna* might mean 'who has performed a successful journey' but it is impossible to decide with certainty that that is the meaning; too much of the sentence is missing to allow of its restoration to its original form.

Despite the incompleteness of these inscriptions which all appear to be by the same hand it is probable that the monument is the gift of a pious Buddhist sea-trader to a temple. As regards the man's residence, Raktamrttikâ *i. e.* Red-earth I would remark that the Chinese accounts make frequent mention of a port in the Gulf of Siam *Chih-tu* 'Red-earth' (see Groeneveldt in Verhand: Batav: Genootschap XXXIX8 2-101) (10) That is probably the place meant.

The style of writing of Buddhagupta's inscription agrees exactly with the type found in Wenggi and in Tjampda in West Java. The agreement is so striking that I have no hesitation in regarding the inscriptions from Wenggi, Tjampa and

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(9) Mrittikâ is a misspelling for *mrttika*. A similar mistake is found in *kritwa* in an inscription at Ajaṇta (Pl. XXI in No. 9 of the Archaeological Survey of Western India by J. Burgess Cp. No. 10 page 79 inscrip. 7) and elsewhere. The mistake is explained by the fact that in many parts of India r is pronounced as *ri*.

(10) Misc. papers relating to Indo-China Second Series Vol. I page 205, 242.

Province Wellesley as being of approximately the same date *i. e.* as belonging to the same century. The inscriptions from Wenggi were determined by Burnell—too early lost to science! —as being of the fourth century (11) and in my opinion, (the grounds for which I have already published) the views of that scholar cannot be far wrong. I should therefore give the date of Buddhagupta's inscription as being roughly 400 A. D. (12) It is undoubtedly the oldest Buddhist fragment yet found in these parts unless indeed the Kedah inscription is given the preference. In view of the fact that the characters in the two inscriptions notably differ—especially in the *ka* and *ṇa* and that the difference in type points to different places of origin, a comparison of the two can lead to no reliable conclusion.

Different again is the type of some of the rock-inscriptions at Tokun, a place lying in the middle of Province Wellesleys The seven fragments copied by Colonel Low and published on Plate IV (13) of the Journal mentioned are so small and, in part, so indistinct that they have no value except as contributions to palaeography.

No. 1 I can decipher in part only. It begins with *sarvva* which is written quite distinctly and in nearly the same type of characters as is Buddhagupta's inscription. The word following seems to represent *ârâma* or *ârâmam*—monastery-garden. The remaining few groups of letters are indecipherable.

No. 2 is in different characters which seem to me, judging from the great development of the vowel-sign for *i.* to be not older than the 6th century. The type reminds me of that at Djamboe and of that at Pattadakal in the Deccan and also of the oldest Cambodian inscriptions of Bhavavarman. The two first words are quite clear; they are *prathame vayasi i. e.* 'in time of youth.' The reading of the next two groups of letters which stand in the same line, is however uncertain. I would read *nâvvi* since this combination is intelligible. The second line I can make nothing of; the three last groups of letters might, allowing for defective writing, represent *dvividham.*

---

(11) South Indian Palaeography Pl. XX and XXI.

(12) The oldest inscriptions in the Talaing Country in Pegu are in the same Wenggi-type and according to Dr. E. Forchammer date from the fourth Century A.D. 'The oldest Talaing inscriptions date back to the 4th Century A. D. and the lythic characters are almost identical with the Dravidian-Vengi alphabet of the same period.' See notes on Buddhist Law by the Judicial Commissioner British Burma (John Jardine) III Marriage page X.

(13) (Misc. Papers relating to Indo-China Vol. I page 231).

The two first letter-groups in No. 4 are *jaya.* In No. 5 I read with some diffidence 48. No. 6 might represent *siddhi.*

These fragments of inscriptions from Tokun do not, like those from Kedah and from the temple ruins in Province Wellesley, bear a clear stamp of Buddhist origin. The most noteworthy point of this respect is the word ârâma—the reading of which is unfortunately not beyond doubt. Fortunately it is clear from the other inscriptions that Buddhist establishments existed in the Malay Peninsula at the period to which the earliest Brahman and Hindu remains in Western Java are referred.

With the exception of the inscriptions mentioned no others have, I believe, been found in the Malay Peninsula itself, but one which formerly stood on a large rock at the entrance of Singapore River, is worthy of description. In the Journal of the Asiatic Society of Bengal for 1837 (14) there is a drawing of this ancient record which shews that even then it had suffered considerably. Later on, shortly previous to the year 1848, the stone was apparently removed and so damaged that a few years later only fragments of it could be found. Mr. Laidlay so far succeeded in deciphering some of the pieces that he was able to give a facsimile. He rightly recognised the Kawi characters in the writing and he came to the conclusion that the language of the inscription was also Kawi. This conclusion was certainly legitimate though Mr. Laidlay could not have known that the Kawi alphabet was at one time used in Java for Sanskrit inscriptions.

---

(14) (Misc. Papers Indo-China Vol. Igepa 219).

I have attempted to decipher the three fragments published by Mr. Laidlay and to determine the language of the inscription but I must confess that I have not succeeded. Most of the characters can be recognised singly but the gaps are so numerous that no words can be positively recognised. Thus I read in the third line of figure 1 the letter-groups *salâgalalasayananara*: in the second line of figure 2 *ya-âmânavana*; in the third line *kesarabharala* in the sixth line of figure 3 *yadalama*. Granted that no vowel-marks and Anusswâra's have been omitted in the facsimile, I see no chance of so dividing these letter-groups as to make an unmistakeable Javanese word. I cannot however assert that the inscription is written in any other language.

In a work entitled 'The Malayan Peninsula' by Captain Begbie quoted by Mr. Laidlay, reasons are given for believing that inscription dates from the reign of Cri-Râja Wikrama (1223-1236). Palaeography is not opposed to the conjecture.

As regards the question, which of the Kawi types—that of Java or of Sumatra, the characters on the Singapore inscription most resemble, some letters, notably *ma*, which in Javanese Kawi differ markedly from those found in Sumatra, reappear in their Javanese form on the Singapore stone and I therefore believe that we must assign the inscription to the Javanese type. *Ma* is the most characteristic letter in these alphabets since it is different both in later Cambodian in the time of sûryavarman (15) and in the Sumatran Kawi. On the other hand the form for *sa* is common to both Sumatran and Javanese Kawi and different in the later Cambodian.

It is to be feared that the Singapore record has been damaged beyond hope of restoration; so much the more reason for fixing our attention on the little of it that remains in transcription.

---

(15) In my paper on the Koetei inscription, I assumed on the strength of one date that Suryawarman reigned in the 8th century of Caka; it appears however from the investigations of Messrs. Aymonier and Bergaigne that this date is two centuries too early, see the remarks of the latter savant in the Journal Asiatique (Eebruary March 1882) Note 4.

Miscellaneous Notes.

By W. George Maxwell.

I have found in an old note book the following jottings of folk lore picked up by me at various times from Pa' Senik, an old Kelantan Malay now resident in Kinta. They are mere trivial disconnected scraps, but are perhaps worth recording.

* * * *

"When one leaves the house to go hunting deer, one "ought, in order to avert from oneself any evil consequences, to "repeat this *mantra*,

"Bukan aku yang memburu,
"Pawang Do Resat yang memburu."

Pa' Senik was unable to tell me anything about Pawang Do Resat or his connection with deer, but supplied the following information about deer generally.

"The first hunter of rusa was Pa' Chu Seming.* Upon "his death, which took place in the *rimba* he became a *hantu* "*rusa.*

"His son Jitan died in the *bluker*, and likewise became a "*hantu.* He looks after the kijang, pelandok and jungle fowl.

"Nang Peluntong Chai was the wife of Pa' Chu Seming. "She died in the *padang.* It is she who sends the deer "away before a drive begins, if the preliminary propitiatory "ceremonies have not been duly performed.

"After the death of these three, the next hunters of deer "were Cho Resat, Do Resat, Pran Ali, Pran Rasu, Pran "Maiar and Putri Bongsu."

---

* Another account, recorded in considerable detail in a Ms. (written by a Perak Malay) which I hope to have ready for the next number of this journal, makes out that Pa' Chu Seming became the *Hantu Pemburu,* the Great Spectral Huntsman.

" Before one goes out shooting, one should make an offer-
" ing at the edge of the forest, and repeat the following *mantra*.

" Chorteh, Chordeng,
" Kong Pali, Nak Terining,
" Marilah terima idangan kami ini,
" Kami na' minta menembak rusa didalam rimba ini"

For the word *rusa* one substitutes *sladang*, *gajah*, *or badak* if necessary. All that Pa' Senik could tell me regarding the four personages invoked in this *mantra* was that they were *Hantu Rimba*.

* * * *

The following is a *mantra* to be repeated after the death of a rusa.

" Om Ma'hong gana,
" Gana kechil, gana besar,
" Gana saratus sembilan puloh;
" Bukan aku mahu buangkan gana,
" Dewa Agong turun buangkan gana;
" Bukan aku mahu mengalahkan gana,
" Dewa Mantra Guru yang mengalahkan gana,
" Dewa Bantra Umar yang mengalahkan gana,
" Dewa Puteh yang mengalahkan gana,
" Sang Kaki Bantra Galah yang mengalahkan gana,
" Dalang Yahuda Semak Turah yang mengalahkan gana,
" Rădîna Kreta Pati Selangor Majitan Petra Jangkal aGajahGemala Kuda Lawi yang membuang gana."

* * * *

Pa' Senik told me that after the completion of the ceremony known as *sapu bahdi*, whereby the evil influence consequent upon the death of a deer are swept away, and after the animal has been cut up, there is a final ceremony called *labor*, of which the literal meaning is " smearing." With a stick, the *pawang* turns over the blood-covered leaves that disfigure the site where the carcase has been out up, and so far as possible attempts to restore the pristine appearance of the place.

As he does so, he repeats this *mantra.*
"Om dĕling kădălîang,
"Sorak tepi di rimba raia,
"Sakali aku balik membuang bala,
"Dua kali aku balik labor,
"Labor anak bini aku,
"Labor segala permainan aku,
"Kalau t'ada satu, ganti dua,
"T'ada dua, ganti ampat,
"T'ada ampat, ganti delapan,
"T'ada delapan, ganti anambelas.
"Labor. Labor. Labor.

The *pantang* in connection with this *mantra* is, that upon its completion, the hunting party must leave the place without looking back.

* * * *

"If, by any mischance, a man is attacked by *bahdi* (the "premonitory systems are dizziness and trembling) he should "collect some of the clay and mud that lies nearest to him and "besmear himself all over with it."

* * * *

If bitten by a snake, or stung by a scorpion, in the forest, one should repeat this *mantra.*

"Medang aku Si Medang Raia,
"Tumbuh di padang gĕlă gâtă,
"Urat menikam ka bumi,
"Puchuk menikam ka angkosa,
"Aku tahu asalnia bisa,
"Sedang Bruai yang punya bisa.

* * * *

If bitten by a water snake, one should call on Hana Taskun, the great Water Jin. Splash water over the wound and call out "Hei! Hana Taskun!" and the swelling will subside

"If poisoned by Sakais' poison (*ipoh*) take some Indian "corn (*jagong*), chew it, then rub the wound with it, repeating "this *mantra*.

"Malim Karimun yang punya tawar,
"Tawar Allah, Tawar Muhammad,
"Tawar Baginda Rasul Allah."

* * * *

Pa' Senik once told me the following account of the *asal snapang*, "the origin of the gun." The story is so ridiculous that it affords matter for speculation as to the manner in which it can have been evolved.

"Abda'l kaka was the son of Nabi Musa, but disgraced "his father by persisting in having dealings with Jins, and "upon his death, Allah punished him by turning him into a "gun."

* * * *

"Halan Muda, Halan Chapik, Halan Glanggi and Halan "Dosa were four men who became tigers."

* * * *

Most people are aware of the Malay belief that a *batul intar* (a stone weapon of the neolithic age often found in Perak) is a thunderbolt, and that when a tree or house has been struck by lightning a *batu lintar* may, if it has not been destroyed by its own blow, be found in the torn-up ground. (Some Malays tell you that the *batu lintar* is a weapon which the Jins hurl at one another in their fights). Pa' Senik supplemented this account by saying that it is dangerous to keep in one's house a perfect *batu lintar* as it has life. A *batu lintar* that has been chipped in any way is however dead, and therefore harmless. The live *batu lintar* will attract lightning to the house, and then disappear in the flash.

* * * *

"The sun and earth had once human form, the sun being "the male and the earth the female. The tin ore found in the "alluvial strata of the Peninsula is the earth's milk, and the "gold is its blood.

"The *pusat bumi*, its navel or centre, is at Acheh. This "was first discovered to be the case by Nabi Ibrahim' by "measurements (sukat)."

(When I suggested that Mecca was the centre of the world, Pa' Senik was for a minute at a loss. Then, with an allusion to the methods of the Survey Department, said that that, of course, was a re-survey).

* * * *

The two following scraps may be assigned to the period of Hindu influence that succeeded the pagan, and preceded the Muhammadan, era.

"The earth is supported upon the horns of a bull. Facing "the bull is a mosquito that threatens, if it stirs, to enter its "nostril and bite it. The bull therefore supports its heavy "load without moving. Sometimes, however, it tosses its head, "and then there is an earthquake."

* * * *

"At the end of the world the sun will go down to hell in "the shape of a bull, and will gore the men who have wor-"shipped him upon this earth.

Notes and Queries.

Colonel Low, writing in 1850, A. D., in Volume IV of the Journal of the Indian Archipelago, page 18, has the following notice of Perak.

"25th: February 1814. The Perak Raja addressed a "letter to the chief authority at Penang: 'I am' wrote this "potentate 'he who holds the royal sword and the dragon betel "stand and the shell which came out of the sea which flowed "from the Hill of Se Guntang.'"

Do the dragon betel stand and this sea-shell still form part of the Perak State Regalia? If so, can any one say what the sea-shell is, and what the legend connected with it is?

This hill, which is perhaps the Sagatang Maka Miru of the Sejarah Malayu, is connected with the Perak regalia in the following lullaby [which was published on page 76 of the "Notes and Queries" of the Society].

Mangqueta nama-nya kayu,
Doun-nya luruh menelentang,
Mahkota raja Malayu
Turun deri Bukit Saguntang.

II

Daun-nya huroh meneletang,
Daun puan di-raut-raut.
Turun deri Bukit Seguntang,
Kaluar deri dalam laut.

W. G. M.

STRAITS BRANCH, ROYAL ASIATIC SOCIETY.

JOURNAL 49. PLATE I.

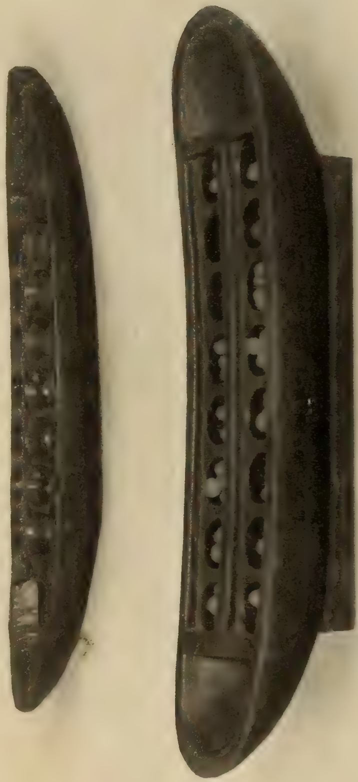

FIG. 1

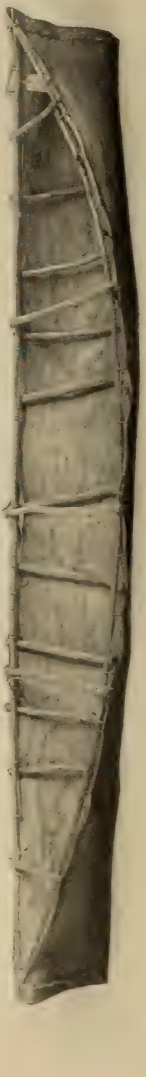

FIG. 2.

FIG. 1.—JONGKAH BOARDS. FIG. 2.—BARK CANOE FROM BORNEO.

Bark Canoes among the Jakuns and Dyaks.

By Dr. W. L. Abbott.

(See Plate I, fig. 2).

As no one seems to have noticed the use of bark canoes in Malaya, the following note may be of interest:

In July, 1902, during a trip up the Rumpin River in Pahang, I saw the Jakuns using some roughly made conoes of bark. It was *meranti* bark as well as I can remember. Their use was said to be confined to the Jekáti and Kerátong tributaries of the Ulu Rumpin.

They were but little trouble to make and the Jakuns brought down large cargoes of Rattans and other jungle produce in them. They did not always take the trouble to take them back up stream again, or to repair them when split or damaged.

I did not measure any of these "rapako," as they are called in the Rumpin, but they were 4 or 5 metres long. /s

I sent a specimen to the National Museum in Washington, but it warped very much out of shape when drying.

The bark is removed from the tree in one large sheet. The ends are cut square and stitched up with small rattan.

Ribs are placed transversely about 18 inches apart, and straight sticks are lashed transversely across at corresponding places to hold the sides in position. A large split rattan encloses the edge of the gunwale. The sewn ends are freely cauled with mud or clay. K

In July 1907, I found similar canoes in use among the Dyaks of the Semundung and Ulu Sempang Rivers, West Borneo. Slightly more roughly made if possible—a thick spongy bark is used containing much resin(?) The same bark is much used as flooring by Malays and Dyaks. The Malays said it was the bark of *bintangor batu* (?)

The Dyaks dispense with the split rattan along the gunwales, as they use a much stronger and thicker bark than the Jakuns. These canoes in no way compare with the elaborate birch bark structures of the North American Amerind~~o~~, s but they are very easily and quickly made. I was told that two Dyaks could make a large canoe in half a day. The Dyaks had no special name for them—they used a term which I can't recall, but it meant only *bark canoe* (according to the Malays).

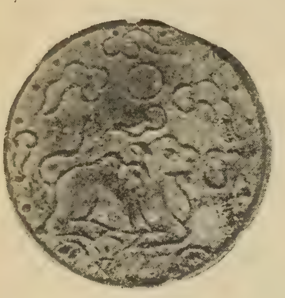

Fig. 1.

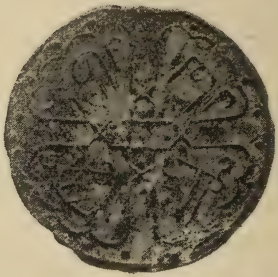

Fig. 1A.

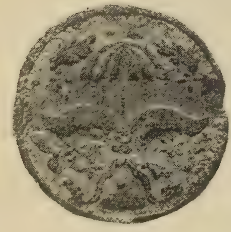

Fig. 3.

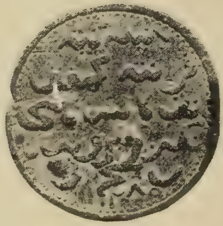

Fig. 3 A.

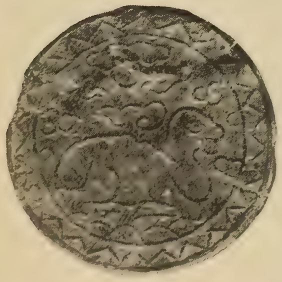

Fig. 2.

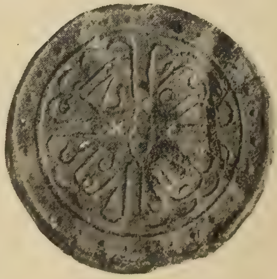

Fig. 2 A.

Tin Coins from Brunei.

Tin and Lead Coins from Brunei.

BY R. HANITSCH, PH. D.

With Plate III.

The curious tin and lead coins from Brunei, Borneo, described below, were, with one exception, exhibited at the Kuala Kangsar Agricultural Show, August, 1907, by Mr. Edmund Roberts, of the P. W. D., Labuan, and subsequently presented by him, on behalf of Pangeran Shabander, of Brooketon, Brunei, to the Raffles Museum, Singapore. They had been found in an earthenware jar, buried two or three feet below the surface, at Brooketon, in July, 1907. A number of coins were in the jar, but most of them were seized by natives and cannot now be found. Those which reached the Raffles Museum were of two types only. A few months later Mr. Roberts presented to the Museum a third kind of coin which he had found when clearing the site for the Brunei residency, in 1906.

The first two coins differ only slightly from each other; one of them is of a simpler design and in a less perfect state of preservation, so that it may be considered as the older one. It is 36 mm. in diameter, 1 mm. in thickness and weighs 5·9 grammes (see pl. III, fig. 1). It is more or less of pure tin, its specific gravity being 7·5 (that of tin is 7·29). Its obverse shows a recumbent buffalo, minus its horns, with erect tail, the space between the figure and the edge of the coin being filled up by circles, cloud-like scrolls, and dots.

The reverse bears an inscription, in Malay characters, which is arranged in what Lane Poole* calls the "mill-sail pattern," a pattern which is met with on Persian and other coins, the writing being placed within the four arms of the sail-wheel. The division into four fields is effected by a line which starts from near the centre of the coin, runs parallel and somewhat to one side of the radius, then turns along the periphery, follows it for nearly 90°, runs back along the next radius, and having thus enclosed the first field which is somewhat smaller than a quadrant, crosses the centre and continues to form a second, third and fourth field, within the second, third and fourth quadrants respectively. The inscription is

---

* See O. Codrington, A Manual of Musalman Numismatics, London, 1904, p. 17.

سلطان العادل ملك الظاهر

or in Romanized characters:
Sultan ul-adil malik ul-dhahir,
i.e. The just Sultan, the acknowledged Ruler.

I am indebted to Mr. M. Hellier for kindly deciphering this coin for me. Unfortunately neither the year nor the name of the sultan is given, nor have I any other data to fix even approximately the age and the origin of the coin. There were four specimens of it.

The second type (see pl. III, fig. 2) is practically of the same size as the first one, viz. 36 mm. in diameter and 1 mm. in thickness, and is only slightly lighter, viz. 5·7 grammes. It is also of tin. It may be of later date as it is better preserved and its design is somewhat more elaborate. There is only one specimen of it.

The obverse shows again the figure of a recumbent buffalo, but with the tail curled downwards. The buffalo with its scroll work is enclosed by a circle, the space between the circle and the margin of the coin, about 4 mm. across, being filled up by a zig-zag line.

The reverse contains the same inscription as the first coin, also arranged in mill-sail pattern. Like the figure on the obverse, the inscription is enclosed by a circular line, the space between the latter and the margin of the coin containing a series of dots.

The third coin, found by Mr. Roberts when clearing the site for the Brunei residency, in 1906, is of lead. It measures 30 mm. in diameter, 1·5 mm. in thickness and weighs 10·6 grammes (see pl. III, fig. 3). Its specific gravity is 10·1, that of pure lead being 11·37, the slight difference probably being due to impurities and oxidation.

The obverse shows the (yellow) State umbrella, one of the insignia of Malay royalty, surmounted by the Sultan's (yellow) flag. The other leaf-like ornamentations have probably no special significance.

The reverse bears the inscription

اينله تيته
ڤرنته كمڤقاتن
كاتس بلنجا نكري
بروني تاريخ ي
١٢٨٥

or in Romanized characters

Inilah titah
perentah kamuafak-
atan ka'atas bĕlanja
Negri Brunei ta-
rikh y
1285

meaning

By order
of the administration
of the Finances
of the State of Brunei
date 1868.

The dates 1285 and 1868 refer, of course, to the Hejira and to the Christian era respectively, and Abdul Mumin was Sultan of Brunei at that time.

I am indebted to the united efforts of the Rev. Dr. Luering and of Messrs. Hellier, McArthur and Elcum for deciphering this coin for me.

Although this coin is of such a recent date, only forty years old, I have not been able to discover any more specimens of it. The only other Brunei coin known to me is the copper cent, dated 1304 A. H. (= 1886 A. D.), which until recently was current in Singapore too.

Explanation of Plate III.

(N. B. All figures are reproduced in natural size).

Fig.	1.	Obverse of tin coin	See	page	111
Fig.	1A.	Reverse of the same	,,	,,	111
Fig.	2.	Obverse of tin coin	,,	,,	112
Fig.	2A.	Reverse of the same	,,	,,	112
Fig.	3.	Obverse of lead coin	,,	,,	112
Fig.	3A.	Reverse of the same	,,	,,	113

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STRAITS BRANCH
ROYAL ASIATIC SOCIETY

[No. 50]

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[No. 50]

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of the

Royal Asiatic Society

SEPTEMBER, 1908

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Printed at The Methodist Publishing House
1908.

Table of Contents.

Council for 1908 v
Proceedings of Annual General Meeting vi
List of Members viii
Annual Report of the Council xiv
Treasurer's Account for the year 1907 xv
Rules of Straits Branch of Royal Asiatic Society ... xvi
A List of the Ferns of the Malay Peninsula, by *H. N. Ridley*, F.R.S. 1
Some Visits to Batam Island, by *C. Boden Kloss*, F.Z.S. 61
Some Ethnological Notes, by *C. Boden Kloss*, F.Z.S. ... 73
The White-Handed Gibbon, by *C. Boden Kloss.* ... 79
Curriculum of a Course in Malay in Paris 81
Father Civet, by *R. O. Winstedt.* 85
Sindbad's Old Man of The Sea, by *W. George Maxwell.* 91
Spada, by *W. George Maxwell.* 97
Two New Species of Cicindela (Tiger beetles) from Borneo, by *Dr. Walter Horn.*... 93
Bats in a Bamboo, by *H. N. Ridley.* 103
The Labiates of the Malay Peninsula, by *H. N. Ridley* 105
The Crackling Moth, by *H. N. Ridley.* 109
New or Rare Malayan Plants, by *H. N. Ridley.* ... 111

THE

STRAITS BRANCH

OF THE

ROYAL ASIATIC SOCIETY.

COUNCIL FOR 1908.

Dr. D. J. Galloway, *President.*
Mr. W. D. Barnes, *Vice-President for Singapore.*
Hon. R. N. Bland, *Vice-President for Penang.*
Mr. H. N. Ridley, *Honorary Secretary.*
Mr. R. J. Bartlett, *Honorary Treasurer.*
Dr. Hanitsch,
Mr. V. S. Flower,
Mr. A. Knight,
Mr. C. B. Kloss,
Mr. H. Marriott,
} *Councillors.*

PROCEEDINGS

of the

Annual General Meeting.

The Annual General Meeting was held March 23, 1908.

Present :

Dr. Galloway, (in the Chair.)

Mr. Knight.
, Hellier.
,, Bryant.
,, Marriott.
,, C. B. Kloss.
Mr. R. A. J. Bidwell.
,, S. V. Flower.
,, R. J. Bartlett.
,, W. D. Barnes.
Dr. Hanitsch.
Mr. H. N. Ridley.

The minutes of the last annual general meeting were read and confirmed.

The secretary's report was laid on the table and accepted. The Treasurer's account was also passed.

It was resolved that the members of the society were desirous of expressing their sense of the loss which the society had sustained by the departure from the East of the Right Reverend Bishop Hose D.D., their President, on his well-deserved retirement after a period of over forty years. It was to him, the Founder of the Society in 1877 that the society was indebted for its inception and for its continuance for thirty years, during which he occupied the position of President almost without a break, till the actual date of his retirement. He also contributed on various occasions to its Journal and in every way possible assisted in the furthering of the objects of the society.

A letter from Mr. H. C. Robinson was read stating that a scheme for the systematic study of the Fauna of the Peninsula had been laid down. The Reptiles. Batrachians and birds had been well studied but the mammals had been as yet little investigated. The Government of the F. M. S. had sanctioned the insertion of a certain sum of money in the estimates for the purpose and it was suggested that the society might provide a substantial grant to be devoted to the same purpose. Eventually the sum $500 a year for three years was voted.

The officers for the ensuing year were then elected *viz.*

President : Dr. Galloway.
Vice-President Singapore : W. D. Barnes.
„ *Penang :* Hon. R. N. Bland.
Secretary : H. N. Ridley.
Treasurer : R. J. Bartlett.
Councillors : Dr. Hanitsch.
„ V. S. Flower.
„ A. Knight.
„ C. B. Kloss.
„ H. Marriott.

List of Members for 1908.

* Life Members. † Honorary Members.

Patron: H. E. Sir John Anderson, K.C.M.G.

Abbott, Dr. W. L.	Singapore.
Acton, R. D.	K. Lumpor, Selangor.
Adams, A. R. Hon. M.L.C.	Penang.
Anderson, E.	Singapore.
Anthonisz, Hon. J. O.	Singapore.
Bampfylde, Hon. C. A.	England.
*Banks, J. E.	Iowa. U. S. A.
Barker, Dr. A. J. G.	Sarawak.
Barnard, B. H. F.	Selangor.
Barnes, W. D.	Singapore.
Bartlett, R. J.	Singapore.
Beatty, D.	Penang.
Bentara Luar, Hon. Dato, S.P.M.J.	Batu Pahat.
Bicknell, W. A.	Penang
Bidwell, R. A. J.	Singapore.
Birch, Hon. J. K.	England.
Birch, E. W., C.M.G.	Taipeng, Perak.
*Bishop, J. E.	N. Sembilan.
Bishop, Capt. C. F.	Pulo Brani.
Blagden, C. O., M.A.	Switzerland.
Bland, Hon. R. N.	Penang.
Bland, Mrs. R. N.	Penang.
Brockman, Hon. E. L.	Kuala Lumpor.

Brown, Dr. W. C.	England.
Bryant, A. T.	Singapore.
Buckley, C. B.	Singapore.
Burgess, P. J.	England.
Burn-Murdoch, A. M.	K. Lumpor, Selangor.
Butler, A. L.	Khartoum, Egypt.
Byrne, H. E.	K. Lumpor, Selangor.
Campbell, J. W.	Kuala Lumpor.
Campbell, A.	
Camus, M. de	
Carruthers, J. B.	K. Lumpor, Selangor.
Cerruti, Giovanni Battista.	Ulu Slim, Perak.
Chapman, W. J.	
Clifford, Hon. H.	Ceylon.
Collyer, Hon. W. R., I.S.O.	England.
Collinge, H. B.	Larut, Perak.
*Conlay, W. L.	K. Lumpor, Selangor.
Cook, Rev. J. A. B.	Singapore.
Curtis, C., F.L.S.	England.
Dallas, Hon. F. H.	Sarawak.
Dane, Dr. R.	Singapore.
Dent, Sir Alfred, K.C.M.G.	England.
Dent, Dr. F.	Singapore.
*Deshon, Hon. H. F.	Sarawak.
Dew, A. T.	Batang Padang, Perak.
Dew, E. Costa.	Singapore.
Dickson, E. A.	Kuala Pilah, Negri Sembilan.
Donald, Dr. J.	Penang.
Douglas, F. W.	Batang Padang, Perak.
Douglas, R. S.	Baram, Sarawak.
Dunkerley, Ven. Arch. W. H. C., M.A.	England.
Edgar, Dr. P. Galistan.	Ipoh, Perak.

Edmonds, R. C.	Penang.
Egerton, His Excellency Sir W., K.C.M.G.	Lagos, W. Africa.
Elcum, J. B.	Singapore.
Everett, H. H.	Santubong, Sarawak.
Fleming, T. C.	Pahang.
*Flower. Capt. S. S., F.L.S.	Ghizeh, Egypt.
Flower, V. A.	Singapore.
Fort, Hon. Hugh.	Singapore.
Freer, Dr. G. D.	Singapore.
Galloway, Dr. D. J.	Singapore.
Gardner, N. E. A.	N. Sembilan.
*Gerini, Lt. Col. G. E.	Bangkok, Siam.
Gibson, W. S.	Singapore.
*Gimlette, Dr. J. D.	Kelantan.
Grandjean, W. D.	Singapore.
Gueritz, E. P. His Ex :	Sandakan.
Haines, Rev. F. W.	Penang.
Hale, A.	Taipeng, Perak.
Hanitsch, Dr. R.	Singapore.
Harrison, Dr. H. M.	Pekan, Pahang.
Haynes, A. Sidney.	England.
Hellier, Maurice.	Singapore.
Hemmant, G.	Kuala Pilah, Negri Sembilan
Hervey, D. F. A., C.M.G.	Aldeburgh, England.
Hewitt, John.	Sarawak.
Hall, G. A.	Singapore.
Hill, Hon. E. C.	Singapore.
Hinks, Lt. T. C.	England.
†Hose, Rt. Rev. Bishop G. F., M.A.	England.
Hose, E. S.	K. Lumpor, Selangor.
Hose, R. E.	Busau, Sarawak.
Hoynck van Papendrecht, P. C.	Germany.

Hullett, R. W., m.a.	England.
Humphreys, J. L.	Malacca.
Izard, Rev. H. C.	Singapore.
Janion, E. M.	Singapore.
Johnston, L. A. M.	Hongkong.
Kehding, Dr.	Medan, Deli.
Ker, J. Campbell.	Johore.
Kinsey, W. E.	Kuala Pilah, Negri Sembilan.
Kirkpatrick, Jivone.	Sarawak.
Kloss, C. Boden.	Kuala Lumpor.
Knight, Arthur.	Singapore.
Knocker, F. W.	Taipeng, Perak.
Krieckenbeek, J. W.	Pahang.
Laidlaw, G. M.	Telok Anson, Perak.
†Lawes, Rev. W. G.	New Guinea.
Laws, G., m.e., a.i.m.m.	Singapore.
Lawrence, A. E.	Sarawak.
Lemon, A. H.	Singapore.
Lermit, A. W.	Singapore.
Lewis, J. E. A., b. a.	Kuching, Sarawak.
Lim Boon Keng, Dr.	Singapore.
Luering, Rev. Dr. H. L. E.	Penang.
Lyons, Rev. E.	Dagupan, Philippine I.
Machado, A. D.	Sungei Siput, Perak.
Maclaren, J. W. D.	Singapore.
MacDougal, Dr. W.	Christmas Island.
Mahomed, bin Mahbob, Hon. Dato.	Johore.
Makepeace, W.	Singapore.
Marriott, H.	Singapore.
Marriner, J. T.	Kelantan.
Marshall, F. C.	Raub, Pahang.

Mason, J. S.	Selangor.
Maxwell, Eric.	Ipoh, Perak.
McCausland, C. F.	Batu Gajah, Perak.
Maxwell, W. Geo.	Singapore.
Moorhouse, Sydney.	Malacca.
Nanson, W., B.A., F.S.A.	Singapore.
Napier, Hon. W. J., D.C.L.	Singapore.
Norman, Henry.	Jugra, Selangor.
Nunn, B.	Malacca.
Pears, Francis.	Muar.
†Perham, Ven. Archdeacon, A.	England.
Pykett, Rev. G. F.	Penang.
Pra, C. Da.	N. Sembilan.
Pringle, R. D.	Singapore.
Pustau, R. von.	Germany.
Rankin, H. F.	Amoy.
Ridley, H. N. M.A., F.R.S.	Singapore.
Rigby, J.	Perak.
Richards, W. S. O.	Singapore.
Roberts, J. A., M.A.	Ipoh, Perak.
Roberts, B. G.	
Robinson, H. C.	K. Lumpor, Selangor.
Rostados, E.	Tras, Pahang.
Rowland, W. R.	Port Dickson, Negri Sembilan.
†Sarawak, H. H. Rajah of, G.C.M.G.	Sarawak.
Sarawar, H. H. The Rance of	England.
†Satow, Sir E. M., K.C.M.G.	England.
Saunders, C. J.	Singapore.
Schwabe, E. M.	Tanjong Rambutan Perak.
Scrivenor, J. B.	Selangor.
Seah Liang Seah	Singapore.

Seah Song Seah	Singapore.
Shelford, R.	Oxford.
Shelford, W. H.	Singapore.
Shellabear, Rev. W. G.	Malacca.
Simmons, J. W.	Tampin, N. Sembilan.
Singer, C.	England.
Skeat, W. W.	England.
Skertchly, E. J.	Penang.
†Smith, Sir Cecil C., G.C.M.G.	England.
Staples, F. W. M.	Klang Selangor.
St. Clair, W. G.	Singapore.
Sugars, J. C.	Batang Padang, Perak.
Tan Cheng Lock.	Malacca.
Tatlock, J. H.	Ipoh, Perak.
Thomas, G. E. V.	Singapore.
Van Benningen von Helsdingen, Dr. R.	Tanjong Pandan, Billiton.
Walker, Lt. Col. R. S. F., C.M.G.	Taipeng, Perak.
Waterstradt, J.	Batjan, Sourabaya.
Watkins, A. J. W.	Singapore.
Welham. H.	Penang.
Wellington, Dr. A. R.	Sarawak.
West, Rev. B. F.	U. S. A.
Wickett, F., M.I.C.E.	Lahat, Perak.
Williams, J. H.	Singapore.
Winstedt, R. O.	Tapah, Perak
Wood, E. G.	Kuala Lumpur.
Wolff, E. C H.	Selangor.
*Young, H. S.	Bau, Sarawak.

Annual Report for 1907.

The Council are glad to be able to state that during the year the financial state of the Society has been satisfactory and that there have been a considerable number of new members added to the Society.

The following were elected this year:

Mr. J. W. Krieckenbeek
,, E. M. Janion
Dr. T. Hayward Hays
Mr. E. Costa Dew
,, C. Da Pra
,, G. A. Hall
,, N. E. A. Gardner
Mr. H. Wellman
,, Humphries
,, J. T. Marriner
,, B. T. K. Johnson
,, E. Anderson
,, Dr. F. Dent
,, Hon. A. R. Adams

The Council have to record the loss to the society of the Right Reverend Bishop Hose who has lately retired from the East. Bishop Hose was the founder of the Society in the year 1877 and was the last member of the original council of the Society in the Straits Settlements. He was the first president of the society and occupied that position almost without break till his retirement in February of this year.

During the past year, the Hon. Secretary, Mr. H. N. Ridley was absent on leave for nine months and Mr. Hellier kindly acted for him.

A journal No. 48 was issued and another No. 49 is ready for distribution to the Members.

A Map Committee was formed to bring out a new edition of the map, the old edition being sold out, and they commenced the work of compiling and revising.

An Index to the Journal was compiled by Mr. W. D Barnes and offered to the Society. It was decided to complete and publish it when volume 50 was published.

A number of books and pamphlets were added by presentation to the Library of the Society.

The Treasurer's report is appended.

HONORARY TREASURER'S ACCOUNT FOR THE YEAR 1907.

	$	c.	$	c.		$	c.	$	c.
Balance brought forward from 1906 :—					Payments in 1907 :—				
Mercantile Bank, Fixed Deposit	2700	..			Methodist Publishing House—Printing ...	653	87		
Chartered Bank, Fixed Deposit	2300	...			Jones and Evans—Books	31	63		
Mercantile Bank, Current Account	68	50			Ah Tep—Book case ...	95	...		
Chartered Bank, Current Account	292	36			Abu Bakar—Book binding	23	...		
Cash in hand	5	...	5365	86	Clerk's Salary ...	60	...		
Receipts in 1907 :—					Peon's Salary ...	24	...		
Subscriptions for 1905 ...	10	...			Postages, petties and discount on foreign cheques	103	66	991	16
,, ,, 1906 ...	100	...			Balance carried forward :—				
,, ,, 1907 ...	385	...			Mercantile Bank, Fixed Deposit	2700	...		
,, ,, 1908 ...	20	...			Chartered Bank, Fixed Deposit	2300	...		
,, Life Membership	50	...			Mercantile Bank, Current Account	425	58		
Sale of Journals ..	340	67			Chartered Bank, Current Account	70	36	5495	94
Sale of Maps	11	57							
Bank Interest, Fixed Deposits	204	...	1121	24					
			6487	10				6487	10

Audited and found correct,

A. Knight.

R. J. Bartlett,

Honorary Treasurer, Straits Branch Royal Asiatic Society.

RULES

OF THE STRAITS BRANCH

OF THE

Royal Asiatic Society.

I. Name and Objects.

1. The name of the Society shall be 'The Straits Branch of the Royal Asiatic Society.'

2. The objects of the Society shall be:—

(a) the increase and diffusion of knowledge concerning British Malaya and the neighbouring countries.

(b) the publication of a Journal and of works and maps.

(c) the formation of a library of books and maps.

II. Membership.

3. Members shall be of two kinds—Ordinary and Honorary.

4. Candidates for ordinary membership shall be proposed and seconded by members and elected by a majority of the Council.

5. Ordinary members shall pay an annual subscription of $5 payable in advance on the first of January in each year. Members shall be allowed to compound for life membership by a payment of $50.

6. On or about the 30th of June in each year the Honorary Treasurer shall prepare and submit to the Council a list of those members whose subscriptions for the current year remain unpaid. Such members shall be deemed to be suspended from membership until their subscriptions have been paid, and in default of payment within two years shall be deemed to have resigned their membership.

No member shall receive a copy of the Journal or other publication of the Society until his subscription for the current year has been paid.

7. Distinguished persons and persons who have rendered notable service to the Society may on the recommendation of the Council be elected Honorary members by a majority at a General meeting. They shall pay no subscription, and shall enjoy all the privileges of a member except a vote at meetings and eligibility for office.

III. Officers.

8. The officers of the Society shall be:—

A President.

Three Vice Presidents, resident in Singapore, Penang, and the Federated Malay States respectively.

An Honorary Secretary.
An Honorary Treasurer.
An Honorary Librarian.
Four Councillors.

These officers shall be elected for one year at the annual General Meeting, and shall hold office until their successors are appointed.

9. Vacancies in the above offices occurring during any year shall be filled by the Council.

IV. Council.

10. The Council of the Society shall be composed of the officers for the current year, and its duties and powers shall be:—

(a) to administer the affairs, property and trusts of the Society.

(b) to elect ordinary members and to recommend candidates for election as Honorary members of the Society.

(c) to obtain and select material for publication in the Journal and to supervise the printing and distribution of the Journal.

(d) to authorise the publication of works and maps at the expense of the Society otherwise than in the Journal.

(e) to select and purchase books and maps for the Library.

(f) to accept or decline donations on behalf of the Society.

(g) to present to the Annual General Meeting at the expiration of their term of office a report of the proceedings and condition of the Society.

(h) to make and enforce by-laws and regulations for the proper conduct of the affairs of the Society. Every such by-law or regulation shall be published in the Journal.

11. The Council shall meet for the transaction of business once a quarter, and oftener if necessary. Three officers shall form a quorum of the Council.

V. General Meetings.

12. One week's notice of all meetings and of the subjects to be discussed or dealt with shall be given.

13. At all meetings the Chairman shall in the case of an equality of votes be entitled to a casting vote in addition to his own.

14. The Annual General Meeting shall be held in February in each year. Eleven members shall form a quorum.

15. (i) At the Annual General Meeting the Council shall present a Report for the preceding year and the Treas-

urer shall render an account of the financial condition of the Society. Copies of such Report and account shall be circulated to members with the notice calling the meeting.

(ii) Officers for the current year shall also be chosen.

16. The Council may summon a General Meeting at any time, and shall so summon one upon receipt by the Secretary of a written requisition signed by five ordinary members desiring to submit any specified resolution to such meeting. Seven members shall form a quorum at any such meeting.

17. Visitors may be admitted to any meeting at the discretion of the Chairman but shall not be allowed to address the meeting except by invitation of the Chairman.

VI. Publications.

18. The Journal shall be published at least twice in each year, and oftener if material is available. In the first number in each year shall be published the Report of the Council, the account of the financial position of the Society, a list of members, the Rules, and a list of the publications received by the Society during the preceding year.

19. Every member shall be entitled to one copy of the Journal, which shall be sent free by post. Copies may be presented by the Council to other Societies or to distinguished individuals, and the remaining copies shall be sold at such prices as the Council shall from time to time direct.

20. Twenty-four copies of each paper published in the Journal shall be placed at the disposal of the author.

VII. Amendments to Rules.

21. Amendments to these Rules must be proposed in writing to the Council, who shall submit them to a General Meeting duly summoned to consider them. If passed at such General Meeting they shall come into force at once.

A List of the Ferns of the Malay Peninsula.

By H. N. Ridley, F.R.S.

As might be expected in a wet tropical forest region such as the Malay Peninsula, the number of ferns is very large, no less than 382 species being recorded, and further the number of individuals is so large that they form a very conspicuous feature in the forests and damp open spots.

That the number of species occurring here will be very largely increased by futher discoveries may be taken as certain, for there still remains a very large area of the country especially in the centre and northern part of the peninsula which has not as yet been investigated by the lovers of ferns.

The ferns of the plain country of the west coast are probably pretty well known and the Thaiping Hills and some of the other hill-ranges have been the collecting grounds of Day, Scortechini, and Kunstler. The ferns of Penang were well collected by Curtis, but the hill-ranges of Selangor and Pahang and the low country of the east coast have as yet been only partially searched and that mainly by myself. The northern states on the borders of Siam have been hardly investigated at all, and are likely to produce many additions to our flora.

In following the arrangement of Beddome's Ferns of British India, I have incorporated into the list some species recorded by him from definite localities in the peninsula which have not been seen by me. There are however a good many recorded by him as from "Malay peninsula" without special localities, and which have not been apparently met with again. These I have excluded at present as some authors include Tenasserim as part of the Malay peninsula and the plants thus vaguely localised may have been obtained across the border.

Jour. Straits Branch, R. A. Soc., No. 50, 1908.

I am indebted to Dr. Christ of Basle for identification of many species, as well as to Bishop Hose, and Surgeon General C. T. Matthew, who always spent his spare time in Singapore during the short stays of his ship in searching the forests of Singapore for ferns, with no little success.

The chief collectors of ferns in the peninsula have been Father Scortechini, Mr. Day, Mr. Kunstler, who collected for the Calcutta Gardens, Mr. Hullett, Right Reverend Bishop Hose, Mr. Curtis and in earlier days W. Norris, Lady Dalhousie, Mr. Pinwill, Dr. Wallich and Cuming.

Habitats. The most abundant and conspicuous fern is perhaps the well-known "Resam" *Gleichenia linearis* which covers considerable tracts of country on the edges of forest, and where the forest has been felled and burnt. In such spots it produces dense thickets very troublesome to penetrate. In the hill districts it is replaced by other species of *Gleichenia, G. hirta, G. glauca* and *G. flagellaris.* In more sandy places in the low country, we find the common bracken, *Pteris aquilina* taking its place. This is probably the most widely distributed and abundant of any vascular plant in the world. It is remarkable too how little this plant varies in different regions of the globe. There is but little visible difference between the bracken of the woods of Kent and that of the hot sandy country of Singapore, the chief difference being the more woody texture of the stalks in the tropical form.

Another fern which forms thick masses is the local *Matonia pectinata* of Mount Ophir and others of our higher hills. This beautiful fern often occurs growing in close thickets, like bracken.

Dipteris Horsfieldii grows in a similar manner over the sea-coast cliffs and on clay banks at 2000 feet and upwards in close masses. It is noticeable that all these ferns are remarkably difficult to cultivate, abundantly and readily as they grow in a natural state. All attempts to grow *Dipteris* and *Matonia* have failed, while the Gleichenias and the Bracken too are notoriously troublesome to transplant.

Very common and conspicuous too are the *Lygodiums,* known here as "Ribu-Ribu," literally "thousands," from their numerous leaflets, *L. circinatum* and *L. microphyllum.* So abundant are these ferns climbing over bushes and through grasses, that they are extensively used in decorating ballrooms in the form of twisted ropes of the ferns.

Anisogonium esculentum is a very common fern fringing the banks of muddy rivers in dense thickets, and very abundant too is the "Lamiding" *Stenochloena palustris* scrambling and climbing over trees and bushes. Both of these last mentioned ferns are eaten as potherbs by the Malays.

Acrostichum aureum a big tufted fern occurring in tidal river mud all over the warmer parts of the world is very abundant. It occasionally is to be met with in damp places far away from the sea or any tidal river. In most of these places however I believe that it has merely persisted for many years after the river on whose banks it formerly grow has been silted up and now forms part of the dry land. A large clump still grows in the Economic Gardens at Singapore where the original river on which it doubtless first started its growth has been dry land since any history of it has been known, though Nipah fruits still dug up in the surrounding soil prove that at one time the tides reached this spot. I have also found the *Acrostichum* far inland at the base of Gunong Pantai in Johor, and still further from the sea at Bukit Asahan at the foot of Mount Ophir and over thirty miles from the Coast. Most of the ferns however occur in a more isolated manner, though many are very abundant.

The richest localities for ferns are the wet densely forested hills at altitudes of from 1000 to 5000 feet but the damp rocky woods of the plains are also very rich. The drier woods are less abundantly supplied, but many species are very characteristic of this kind of locality. Such are the Schizoeas, Lindsayas, Nephrodiums.

Even the sands of the sea-coast produce some species such as *Davallia solida* and *D. elegans,* the *Humatas* and *Schizaea dichotoma.* At high elevations there is a noticeable disappearance of the thin textured ferns such as the Nephrodiums and Lastraeas, which are replaced by the more coriaceous leaved xerophytic *Dipteris, Matonia, Polypodiums, Oleandras* and such ferns.

Epiphytic species are very abundant frequently covering the trees, especially at high altitudes, but as it seen in other groups of plants, ferns which in the plants only occur on the upper branches of lofty trees, grow at an altitude of three or four thousand feet quite low down, and not rarely on rocks. Some of these high growing ferns are not at all easy to cultivate at low altitudes, but *Davallia triphylla* which only occurs in a wild state on the topmost boughs of trees a hundred or a hundred and fifty feet high, I have met with on several occasions transplanted, accidentally or intentionally to the base of trees a few feet from the ground and thriving well. This fern was formerly considered so rare that about 20 years ago few herbaria in Europe had a specimen, but as a matter of fact it is by no means a rare plant. Growing as it does only on the inaccessible branches of lofty trees, it could only be obtained by searching for fallen boughs on which it happened to be growing.

Two of the most curious of our ferns are epiphytic plants remarkable for their rhizomes being modified so as to form nests for ants. They are *Lecanopteres carnosa* and *Pleopeltis sinuosa.* The former which occurs abundantly on trees at 3000 much after the manner of the rubiaceous plant *Myrmecodia. Pleopeltis sinuosa* has a thick scaly rhizome hollow inside and also inhabited by ants. It is abundant in Singapore. It is curious that fleshy and succulent as the rhizome of this plant is, it is one of the first epiphytic plants to die during a short dry spell. One would have thought its supply of water in the rhizome would have been sufficient to have prevented this.

Distribution of Ferns. As ferns are disseminated by the floating of their dust-like spores on the wind to immense distances it will easily be understood that many of the species have a very wide distribution over the surface of the globe. Ferns indeed are among the first of the higher plants to appear on newly cleared ground, if the soil and climate suit them.

The majority of our ferns occur in the Malay islands also, and a large proportion are found in the Mascarene islands, as well as India and Polynesia and South America, which is not the case with the higher flowering plants, few of which except some weeds carried about by human agency have as wide a distribution. Six species even occur in the British Isles, viz., *Trichomanes radicans, Hymenophyllum Tunbridgense, Pteris aquilina, Lastrea Thelypteris* and *Polystichum aculeatum* and *Adiantum Capillus-veneris.*

There are however about 40 species which are endemic, never having been collected anywhere else except in the peninsula at present.

USES OF FERNS.

A good many of the local ferns are used for food in the form of pot herbs in place of spinach, or as sumbuls with curry, but chiefly by natives; for excellent as many of these are, Europeans are not acquainted with their merits and rarely use them. Among the most popular are *Stenochloena palustris* the "Miding" or "Lamiding" of the Malays, *Anisogonium esculentum* "Paku Anjing," and the water-fern *Ceratopteris thalictroides,* which occurs often abundantly in ditches. Of these ferns the young fronds are collected and boiled.

From the stems of Resam, (*Gleichenia linearis*) are made pens, and they are also used for making the walls and partitions of the fishing-stakes.

The fronds of the common *Pleopeltis Phymatodes,* when dry, exhale a delicious odour of Coumarin, like that of the Tonkin bean. Hence this fern is known as Paku Wangi or scented fern. The fronds are dried and put among clothes, especially I am told by the Eurasian population in order to give them a pleasant perfume.

Comparatively few ferns are accredited here with medical properties. The golden brown hairs on the rhizome of *Cileotium Barometz* are used as a styptic for wounds for which they are very suitable, and the rhizomes are sold in the drug-shops under the name of 'Penawar Jambi.' This vegetable fur is even exported to Europe for the same purpose, being used not only as a styptic but as an antiseptic in planters.

The fronds of the number of a softer textured ferns are used pounded up as poultices for boils or sores; such are those of *Cyathea Brunonis* (also eaten as a pot herb by Jakuns), and *Phegopteris punctatum.*

The ashes of *Drynaria quercifolia* fronds are applied to the abdomen in cases of miscarriage.

GLEICHENIACEAE.

Gleichenia.

Gl. circinata (Sw.) Damp rocks and streams at about 4000 feet elevation. Malacca, Mt. Ophir (Hullett, Derry 605); Perak, Gunong Bubu (Cantley); Kedah, Gunong Jerai (Ridley). Distrib. Australia, New Zealand and New Caledonia.

Gl. dicarpa (Br.) Perak, Gunong Berumbun (Wray 1584); Province Wellesley, Bukit Panchur (Ridley 12633).

var. *alpina* Bedd. Perak (Scortechini, King's Coll. 7345). Distrib. Malay isles, Australia, New Zealand.

Gl. hirta (Bl.) Hill districts. Malacca, Mt. Ophir (Lang, Ridley); Perak (Scortechini); Penang Hill (Norris, Hullett); Kedah, Gunong Jerai (Ridley).

Gl. Norrisii Mett. Hill districts. Perak, Bujong Malacca (Ridley 9599, Curtis 3314); Gunong Bubu (Wray 240); Gunong Batu Putih (Wray 243). Endemic.

Gl. glauca (Hook.) *G. longissima* Bl. Very abundant at about 1000 feet elevation and upwards, forming dense masses. Johor, Gunong Pulai (Ridley 12127); Malacca, Mt. Ophir (Lang); Perak, Larut Hills (Fox 131, Ridley 10658); Penang Hill very abundant (Ridley 7082); Kedah, Gunong Jerai (Ridley). Distrib. Malaya, China, Australia, Polynesia, Trop. America.

Gl. flagellaris Spr. Abundant on hill tops from about 1000 feet upwards. Malacca, Mt. Ophir (Derry 604); Negri Sembilan, Gunong Angsi (Ridley); Perak, Maxwell's Hill (Ridley 10659); Penang Hill (Hullett). Distrib. Mascarene isles, Malay isles, Polynesia.

Gl. linearis (Burn). *Gl. dichotoma,* Willd. The commonest occurring everywhere in the low country, in immense almost impenetrable masses. Native name "Resam." The stems used for making pens, and also for fishing stakes. Singapore, Tanglin, etc. (Ridley); Malacca; Johor, Gunong Pulai (Ridley 12128); Perak, Gopeng, Sungei Rayah (King's Coll. 1065); Penang. Distrib. India, Japan, Australia, Polynesia, Trop. America.

CYATHEA.

C. Brunonis Wall. Common in woods at no great elevation. Native names "Paku Pahat," "Paku Gajah Payah," "Paku Hitam Payah," "Paku Salamah." The leaves are eaten as a vegetable by the Jakuns, and also used to poultice sore legs. Johor, near Castlewood, Batu Pahat (Ridley 11061); Negri Sembilan, Perhentian Tinggi (Ridley); Malacca, Bukit Kayu Arang (Cantley's Coll.), Bukit Tungul (Ridley 4403), Bukit Bruang; Pahang, Tahan River (Ridley); Selangor, Kwala Lumpur (Ridley 10483), Batang Padang (Murdoch); Perak, Goping (King's Coll. 475), Larut (King's Coll. 4885); Penang Hill near the top (Ridley 7036). Distrib. Malay islands.

AMPHICOSMIA.

A. alterans Hook. Singapore, Bukit Timah (Ridley 12554); Johor, Batu Pahat (Hullett); Selangor, Kwala Lumpur (Ridley 10173); Perak, Gunong Bubu (Cantley); Penang Hill, Penara Bukit (Ridley 7153, 7156, 10139). Distrib. Borneo.

A handsome tree fern in damp forests.

ALSOPHILA.

A. latebrosa Hook. The commonest tree fern in the low country, stem 8 to 12 feet tall. Singapore common, Bukit Timah, Chan Chu Kang (Ridley 6123), Chua Chu Kang (Ridley 6029); Johor, Tanjong Kupang (Ridley 4400); Malacca, Ayer Panas, Ayer Keroh (Ridley 10705); Selangor, Batang Berjuntai (Ridley 7870), Gua Batu (Ridley 8141); Perak, Larut (King's Coll. 23591, 7317), Thaiping (Curtis); Penang Hill, Province Wellesley, Tasek Gelugur (Ridley 6965); Kedah, Yan (Ridley 5177).

A. comosa Hook. Not rare in the low country, stem 8 or 9 feet tall. Singapore, Bukit Timah, Jurong (Ridley 5756). Reservoir woods. Perak, Kinta (King's Coll. 7148), Larut (Bishop Hose); Penang Hill (Hullett), Road to Penara Bukit (Ridley 7153). Distrib. Malay isles.

A. Ridleyi Baker. Stem very short almost none. Damp lowwoods. Singapore, Sungai Morai (Ridley 4401), Chan Chu Kang (Ridley 6122), Chua Chu Kang (6031). Endemic.

A. commutata Mett. Hills at 4000 feet. Malacca, Mt. Ophir (Ridley 9857, 3319); Pahang, Kluang Terbang (Barnes); Selangor, Bukit Hitam (Ridley 7869); Perak, Larut (King's Coll. 1908, 7150), Gunong Bubu (Cantley), Bujong Malacca (Ridley 9604).

A. glabra Hook. Perak (Scortechini); Kedah Peak (Ridley 5156, 5157); Langkawi, Gunong Rayah (Curtis). Distrib. India, China, Malaya.

A. glauca (Sw.) *A. contaminuus* Hook. A splendid tree fern sometimes 20 feet tall, with the rachis and petiole ashy blue. Johor, Bukit Soga (Ridley 1066); Sungei Ujong (Hullett); Selangor, Pahang track (Ridley 8633), Ginting Bidai (Ridley 7868); Perak, Larut Hills (King's Coll. 4032). Common near the top of the hills.

Penang Hill common at the top (Ridley 7150). Distrib. India and Malay islands.

I found a very curious form with fasciated fronds on the Thaiping hills near the top.

A. *Kingii* Bedd. Johor, Gunong Panti (Ridley); Perak, top of Gunong Bubu (King's Coll. 7402, Wray 3860). Endemic.

A. *crenulata* Mett. Johor, Gunong Panti (Ridley); Selangor, Bukit Kutu (Ridley 7865); Dindings, Lumut (Ridley); Perak, Gunong Keledang (Ridley 9548), Bujong Malacca (Ridley 9551); Waterfall, Thaiping Hills (no 7865). Distrib. Java.

A. *dubia* Bedd. Perak (Scortechini), Larut (King's Coll. 2493). Endemic.

A. *obscura,* Scort. Perak, Gunong Hijau (Scortechini). Endemic.

A. *trichodesma* Bedd. Perak (Scortechini). Endemic.

MATONIA.

M. *pectinata* Br. By no means one of the rarest ferns as Beddome says. It is local but usually very abundant growing like bracken, where it occurs usually in open spots on the top of hills. Malacca, Mount Ophir, Padang Batu, (all collectors) 3000 feet elevation. Selangor, Hulu Semangkok (Ridley); Perak, Gunong Bubu (Scortechini 761); Kedah Peak (Ridley).

It also occurs in the Carimon islands quite low down near the Waterfall and in Borneo.

DICKSONIEAE.

DICKSONIA.

D. *ampla* Bak. Perak, Maxwell's Hill (Ridley 5188), (King's Coll. 2159). Also Borneo.

D. Kingii Bedd. Perak, Gunong Batu Putih (King's Coll. 8058) and Larut (2118). Endemic.

CIBOTIUM.

C. Barometz, Link. In woods at no elevation, not rare. Native name "Penawar Jambi." The hairs from the rhizome sold as a styptic. The rhizome usually short creeping but I found it with a stem 4 feet tall on Kedah Peak. Johor, Batu Pahat (Ridley 10981); Selangor, Bukit Kutu (Ridley 7864); Perak, Bujong Malacca (Ridley 9532), Gunong Batu Putih (Wray 489), Gunong Hijau (Scortechini 1226); Kedah, Gunong Serai (Ridley 5176); Penang, Mt. Erskine (Curtis). Distrib. Malay islands and S. China.

LECANOPTERIS.

L. carnosa Bl. Epiphytic with great irregular hollow tuberculated rhizomes full of ants. On very lofty Dipterocarpus trees in the lower country, on lower trees in the hills. Singapore, Bukit Timah (Ridley); Malacca, Sungei Hudang (Goodenough no 1477); Selangor, Bukit Hitam (Kelsall); Perak, Thaiping Hills (Hervey, etc.) very abundant, Gunong Bubu (Cantley). Distrib. Malay isles.

HYMENOPHYLLUM.

H. polyanthos Sw. Common on trees and rocks, in the low country and up to a considerable altitude. Singapore, Bukit Timah, Bajau, Kranji (Ridley 5607); Johor, Kampong Bahru, Gunong Pulai (Ridley); Pahang, Tahan River (Ridley); Malacca, Mt. Ophir (R. Derry); Perak, Bujong Malacca (Ridley 9609); Penang Hill (Hullett, Ridley 7072); Kedah, Gunong Jerai (Ridley).

var. *Blumeana.* Singapore, Bukit Timah (Matthew), Sungei Morai (Ridley 4406), Bukit Mandai (Ridley

8938); Pahang, Tahan River (Ridley); Selangor, Bukit Kutu (Ridley 7872); Perak (Scortechini 320).

H. javanicum (Spreng). Rocks and trees from about 1000 feet upwards. Johor, Gunong Pulai (Hullett); Malacca, Mt. Ophir (Ridley 9992); Selangor, Pahang Track (Ridley 8773, 8774); Perak, Thaiping Hills (King's Coll. 2187, Scortechini, Wray), Bujong Malacca (Ridley).

var. *badium*. Perak, Maxwell's Hill (Bishop Hose, Ridley 5182, Curtis 2084); Penang Hill (Hullett). Distrib. Mascarene islands, India to Australia.

H. Smithii Hook. Singapore, Kranji (Matthew); Johor, Gunong Banang, Batu Pahat (Ridley 10985); Selangor, Semangkok Pass (Ridley 12034); Penang Hill (Ridley 7072). Distrib. Malay isles.

H. productum Kze. Singapore, Kranji (Ridley 1687); Perak, Maxwell's Hill (Wray); Kedah, Gunong Jerai (Ridley). Distrib. Malaya, Polynesia.

H. dilatatum (Sw.) Perak, Larut (King's Collector). Distrib. Java and New Zealand.

H. tunbridgense Sm. Rare. Kedah Peak (Ridley 5178). Distribution Europe, Africa, South America and New Zealand. Identified by Dr. Christ.

H. aculeatum V. D. Bosch. Singapore, Woodlands (Christ); Perak at 4000 feet alt. (King's Coll.); Penang 3000 feet alt. (Day). Also Java.

H. affine V. D. Bosch. Johor, Mt. Austin (Ridley 12539, 12540), Gunong Pulai (Ridley 12135). Distrib. Java.

H. denticulatum Sw. Singapore, Kranji (Ridley 1687); Perak, Maxwell's Hill (Wray); Kedah, Gunong Jerai (Ridley). Distrib. Java.

H. Neesii Hook. Common on trees low country up to 4000 feet elevation. Singapore, Bukit Mandai (Ridley 9840), Kranji, Woodlands, Selitar; Johor, Pengaram, Tanjong Bunga (Ridley); Malacca, Mt. Ophir, Gunong Mering (Ridley), Batu Tiga (Derry); Pahang, Tahan River

(Ridley 2153, 2174), Kluang Terbang (Barnes); Selangor, Rawang, Bukit Kutu (Ridley 9852), Hulu Semangkok (12036); Negri Sembilan, Perhentian Tinggi (Ridley); Dindings, Lumut (Ridley 7145); Perak (Scortechini), Maxwell's Hill (Curtis 2083), Bujong Malacca (Ridley 9610); Penang Hill, Penara Bukit (Ridley 7146). Distrib. Malay isles, Fiji.

TRICHOMANES.

Tr. Motleyi V. D. Bosch. Singapore, Stagmount (Ridley). Distrib. Tenasserim, Andamans, Ceylon, Borneo, New Caledonia.

Tr. Henzaianum (Parish). Singapore, Feruvalley, Bukit Timah (Matthew). Distrib. Burmah.

Tr. muscoides (Sw.) On Rocks. Singapore, Feruvalley, Bukit Timah; Malacca, Mt. Ophir (Ridley). Distrib. India and Tropical Africa and America.

var. *sublimbatum*. Very near the last species. Perak, Rocks, Bujong Malacca (Ridley).

Tr. neilgherrense, Bedd. Perak (Scortechini). Distrib. S. India.

Tr. parvulum Poiret. Perak (Scortechini); Penang Hill (Ridley 1748); Kedah Peak (Ridley). Distrib. Madagascar, India, Malay isles, Japan, China and Polynesia.

Tr. humile Forst. Singapore, Woodlands (Matthew). Distrib. Pacific islands, Philippines.

Tr. palidum Bl. On trees and rocks usually at a considerable elevation, easily recognized by its ashy grey color when alive. Singapore, Kranji (Matthew); Johor, Gunong Panti (Ridley 4161); Malacca, Mt. Ophir (Ridley 9885); Perak, Gunong Hijau (Scortechini). Distrib. Java.

Tr. digitatum Swartz. On trees. Singapore, Kranji (Ridley); Pahang, Tahan River (Ridley); Selangor, Bukit Kutu (Ridley 7873); Perak (Scortechini), Gunong

Hijau (Ridley); Penang Hill (Bishop Hose), Penara Bukit (Curtis 3062); Kedah Peak (Ridley). Distrib. Mauritius and Java.

Tr. proliferum Bl. Perak, Larut 100-4000 feet (King's Coll. 2565). Distrib. Java, Philippines.

Tr. bipunctatum Poir. *T. Filicula* Bory. On rocks. Singapore, Chan Chu Kang (Ridley); Johor, Gunong Panti (Hullett); Selangor, Bukit Hitam, Petaling, Langat, Batu Caves (Ridley 8143), Pahang Track (Machado); Dindings, Lumut (Ridley); Perak, Larut (King's Coll. 1860, 1913, Scortechini), Thaiping (Ridley), Bujong Malacca (Ridley 9606). Distrib. African islands, India, Ceylon, Pacific islands.

Tr. pyxidiferum L. Perak (Scortechini), Goping (King's Coll. 4185); Penang Hill (Ridley). Distrib. Brazil.

Tr. javanicum Bl. very common on rocks in forest. Singapore, Bukit Timah (Ridley 9569); Johor, Gunong Panti, Batu Pahat (Ridley 11065); Pahang, Tahan Woods (Ridley 2181); Selangor, Rawang, Bukit Hitam, Pahang Track (Ridley 8665); Dindings, Lumut (Ridley 7149*a*); Perak, Maxwell's Hill at 3000 feet (Scortechini 541), Goping (King's Coll. 584); Penang Hill (Ridley 7149); Lankawi (Curtis 2423). Distrib. India, Malay Archipelago.

Mixed with garlic and onion the dried fronds are smoked as tobacco to cure headaches.

Tr. rigidum, Swartz. Common in woods. Singapore, Bukit Timah, Sungei Buluh, Chan Chu Kang (Ridley 6119), Toas (4407); Johor, Castlewood, Gunong Pulai (Ridley); Pahang, Tahan River (Ridley 2161); Malacca, Mt. Ophir (Ridley 3332, 3320); Negri Sembilan, Gunong Angsi (Ridley 11815); Selangor, Batu Caves (Ridley 8661), Bukit Hitam (Kelsall), Bukit Kutu (Ridley 7871); Perak, Larut (King's Coll. 2404); Penang Hill (Ridley); Kedah, Gunong Jerai (Ridley); Tringanu, Bundi (Rostado). Distrib. S. Africa and islands, Ceylon, Malay Archipelago, Polynesia and S. America.

Tr. pluma Hook. Not rare in the hills at about 4000 feet alt. Malacca, Mt. Ophir (Bishop Hose, etc.); Selangor, Bukit Hitam, Ginting Bidai, Semangkok Pass (Ridley 12107); Perak, Bujong Malacca (Ridley), Gunong Bubu (Cantley), Gunong Hijau (Wray, Scortechini 344).

Tr. parviflorum Poir. *Tr. foeniculaceum* Bory. Singapore, Moores Herb (fide Beddome); Perak, Gunong Bubu (Murton). Distrib. Mascarene isles, Borneo, Queensland.

Tr. gemmatum Sm. Malacca, Mt. Ophir, Mering and Tunduk (Ridley 9881, Derry 607). Distrib. Malay isles, Polynesia, S. America.

Tr. apiifolium, Presl. Malacca, Mt. Ophir (King's Collector fide Beddome). Distrib. Malay isles, Polynesia.

Tr. hispidulum Mett. Singapore, near Selitar (Matthew and Ridley); Perak and Goping (King's Coll. 531), Tapa (Wray 1365). Distrib. Borneo.

Tr. maximum Bl. Johor, Gunong Panti (Ridley); Malacca (loc. incert.), (Hervey); Selangor, Pahang Track (Ridley 8638), Semangkok (12032); Perak, Bujong Malacca a curious small form (Ridley 9534), Larut 2500-3000 (King's Coll. 2225-5286), Maxwell's Hill (Scortechini 225), Tea Gardens (Ridley 3059). Dsitrib. Malay isles and Polynesia.

Tr. radicans, Sw. Johor, Patani, Batu Pahat (Ridley 10979); Malacca, Jeram Nyalas (Derry 1126); Sungei Ujong (Hullett); Perak, Maxwell's Hill (Ridley 5183, 1670), Gunong Batu Putih (King's Coll. 8045); Penang Hill at 2500 feet (Hullett). Distrib. Both hemispheres.

Tr. denticulatum Bl. Johor, Gunong Pantai, Gunong Pulai (Ridley 12135); Negri Sembilan, Perhentian Tinggi (Ridley); Penang Hill; Kedah Peak (Ridley). Distrib. Java.

Tr. auriculatum Bl. In the hill woods on trees. Selangor, Ginting Bidai (Ridley 7874); Perak, Maxwell's Hill (Curtis, Scortechini), Gunong Batu Putih (Wray 351). Distrib. Malay isles, Japan and Guiana.

Tr. malaccense Christ. Malacca, Mt. Ophir (Lang); Perak, Bujong Malacca (Ridley 9611), Thaiping Hills. Endemic.

Tr. obscurum Bl. Malacca, Mt. Ophir, Gunong Tunduk (Ridley 9882, 9883); Perak, Bujong Malacca (Ridley 9608). Distrib. Java.

Tr. Ridleyi Chr. Singapore, Bukit Timah (Ridley).

Tr. sp. Penang, Moniots Road (Matthew).

DAVALLIEAE.

HUMATA.

H. heterophylla Smith. On dead trees or high up on living ones, or also on the ground near the sea. Singapore, Kranji (Ridley 8940), Bajau, Changi beach (4355), Pulau Brani and Pulau Ubin (Hullett); Johor, Bukit Patani, Batu Pahat (Ridley); Pahang, Pekan (Ridley 2160); Perak, Lampatang (Scortechini 1554), B. P. D. (King's Coll. 7821). Malay isles, Polynesia.

H. angustata Wall. Singapore (Cuming 335), Sungei Morai, Chan Chu Kang (Ridley 3599); Johor, Bukit Pengarum, Kampong Bahru (Ridley); Malacca, Mt. Ophir (Ridley 3336); Selangor, Pahang Track (Ridley 8647); Dindings, Lumut (Ridley 7136); Perak, Sungei Ryah (King's Coll. 828), Maxwell's Hill (Scortechini 408), Bujong Malacca, Gunong Keledang (Ridley 9550); Penang, Waterfall (Ridley), Hill (King); Kedah Peak (Ridley 5179). A very curious form crenately deeply lobed to the midrib grows on the rocks on Padang Batu, Mt. Ophir (No. 3339). Endemic.

H. parallela Wall. Singapore, Tanjong Merawan (Ridley); Malacca and Johor; Pahang, Pekan (Ridley); Lankawi (Curtis). Distrib. Burmah to Polynesia.

H. pedata Smith. Singapore, Kranji; Johor, Sungei Bau, Mt. Austin; Malacca, Tanjong Kling (Ridley); Pahang, Tahan River (Ridley), Kluang Terbang (Barnes); Dindings, Lumut (Ridley 7155); Tringganu, Bundi (Rostado); Penang (King 1374), Penang Hill (Ridley 7077); Kedah Peak (Ridley 5179); Lankawi (Curtis). Distrib. Malay isles, India, Ceylon, Mascarene isles.

H. pinnatifida Baker. Rare. Malacca Mt. Ophir (Ridley); Perak, Larut 3-4000 feet alt. on trees (King's Coll. 6393). Also Borneo.

H. sessilifolia Bl. "Singapore Sinclair") Beddome. Distrib. Java. Not seen.

LEVCOSTEGIA.

L. hymenophylloides Bl. On rocks and rotten trees. Perak, Bujong Malacca (Ridley 9545), Gunong Batu Putih (King's Coll. 8046), Kinta (King's Coll. 7128); Penang, near Richmond pool (Hullett, King). Distrib. Malay isles to Polynesia.

L. nodosa Presl. Perak, top of Gunong Bubu 5000 to 5300 feet alt. (King's Coll. 7421, Wray 383). Distrib. India and Java.

L. parvula Sm. On trees in mangrove swamps. Singapore, Sungei Buluh, Tanjong Merawan, Kranji (Ridley 87). Distrib. Malay isles.

L. affinis Hook. Perak, Gunong Batu Putih (Wray 1030); Penang (Lady Dalhousie). Distrib. Ceylon and Malay isles.

PROSAPTIA.

P. Emersoni Presl. On trees and rocks usually on the hills. Johor, Gunong Pulai (Hullett); Malacca, Batu Tiga (Derry); Selangor, Rawang, Bukit Kutu and Bukit Hitam (Ridley 8964); Perak, Hermitage Hill, Bujong Malacca (Ridley), Maxwell's Hill (Scortechini 120, 215); Prov. Wellesley, Bukit Panchur (Native Coll.); Penang, Government Hill (Ridley, Kunstler 1307); Kedah Peak (Ridley 5170). Distrib. Malay isles and India.

P. contigua Swartz. Pahang, Tahan River (Ridley); Sungei Ujong (Hullett); Perak, Gunong Hijau (Scortechini 490). Distrib. Malay isles and India.

DAVALLIA.

D. solida Swartz. Common on tree trunks and in dry sandy spots. Singapore, abundant in the Botanic Gardens, Sungei Morai (Ridley); Johor, Jaffaria (King); Pahang; Perak, Kinta (King's Coll. 7068); Selangor, Ginting Bidai (Ridley 984); Penang, above the Waterfall (Hullett); Kedah, Yan (Ridley). Distrib. Polynesia and Malay isles.

D. elegans Swartz. On trees or sandy points, "Paku Terutep." Singapore, Changi beach (Ridley 4351); Pahang, Pekan, Kota Glanggi (Ridley 1598*a*); Malacca, Sungei Hudang (Ridley), Pulau Undan (Cantley's Coll.), Jasin (Goodenough); Selangor, Semangkok Pass (Ridley); Perak (Scortechini), Thaiping Hills Cottage (Hervey); Tringganu, Cherating River (Ridley); Prov. Wellesley, Permatang Bertam on cocoanut trees (Ridley); Kedah, Kedah Peak (Ridley 5159). Distrib. Africa, India, China, Malay isles, Polynesia.

D. epiphylla Bl. On rocks. Perak, Gunong Batu Putih (King's Coll. 8037). Distrib. Polynesia and Java.

D. divaricata Bl. Perak (Scortechini). Distrib. Java.

D. bullata Wall. Selangor, Pahang Track (Ridley 8637); Perak, Larut Hills 3500-4000 feet alt. (King's Coll. 6081), Caulfield's Hill (Scortechini 391); Kedah Peak, rocks of the precipice (Ridley 5158). Distrib. Assam and Nepal.

D. triphylla Hook. On boughs of lofty trees rarely low down. Singapore (Cuming 339), Woodlands, Bukit Timah

(Ridley 9095); Johor, Bukit Patani, Batu Pahat (Ridley 11064), Gunong Pulai (Hullett); Negri Sembilan, Perhentian Tinggi (Ridley 10819); Perak (Scortechini). Endemic.

MICROLEPIA.

M. pinnata Cav. "Paku Merah" on banks in the hills. Johor, Gunong Pulai (Ridley); Malacca, Mt. Ophir (Ridley 3318); Selangor, Batang Padang (Near dock), Bukit Hitam (Ridley), Pahang Track (Ridley 8660); Perak, Larut Hills (Scortechini 153, 407), Gunong Keledang (Ridley 9541) and Bujong Malacca (9533); Penang Hill abundant at the top (Bishop Hose, Ridley, Wallich, Lady Dalhousie).

var. *luzonica*. Perak, Larut (King's Coll. 2144). Distrib. Philippines.

M. strigosa Swartz. Selangor, Rawang, Ginting Bidai, Bukit Kutu (Ridley 7860); Penang, Penara Bukit (Curtis 3061).

M. Kurzii Clarke. Perak, Gunong Bubu (King's Coll. 8331).

M. marginalis Thunb. Lankawi (Curtis) not in fruit but the frond resembles this plant.

D. Mooreana aff. but pinnules much larger. Perak, Larut Hills (Curtis 3723).

M. speluncae L. Singapore, Ang Mo Kio, Changi (Ridley 6034), Gelang by a tidal stream (6248); Johor, Tebing Tinggi (Ridley); Pahang, Kuala Tahan; Selangor, Caves, Kuala Lumpur (Ridley 8641), Ginting Bidai (Ridley 7855); Negri Sembilan, Perhentian Tinggi (Ridley 9856); Perak, Thaiping (King's Coll. 8371), Tanjong Malim (Ridley), Telor Pinang (9746); Penang (Curtis); Prov. Wellesley, Tasek Gelugur (Ridley); Kedah (King's Coll. 1245), Lankawi (Fox); Kelantan, Kamposa (Ridley) a very glabrous form.

var. *hirta*. Selangor, 15th mile Pahang Track (Ridley 8637); Perak, Ulu Kerling (King's Coll. 8661).

M. moluccana Bl. Perak alt. 3000-4000 feet (Scortechini), Maxwell's Hill (Curtis 2085); Selangor, Pahang Track (Ridley 8634). Distrib. Malay isles.

STENOLOMA.

S. chinensis Swartz. The Lace fern, on banks at considerable altitudes, this plant seems to prefer stiff yellow clay. Pahang, Kuala Pahang near the Sultans tombs (Ridley 4230), Tahan River; Selangor, Ginting Bidai, Semangkok Pass common (Ridley); Penang, Penara Bukit, etc. common (Ridley). Distrib. Mascarene, India, Malay isles, China, Polynesia.

LINDSAYEAE.

LINDSAYA.

L. cultrata Swartz. On rocks and banks. Pahang, Tahan River (Ridley 2151); Malacca, Mt. Ophir (Ridley); Selangor, Rawang, Ginting Bidai (Ridley 7876); Perak, Larut (Scortechini, King's Coll. 2473), Tea Gardens (Ridley), Bujong Malacca (Ridley 9605); Kedah Peak; Lankawi (Curtis).

var. *Lobbiana.* Pahang, Tahan River (Ridley). Distrib. Mascarene isles, India, Japan, Australia.

L. repens Thw. Singapore, Bukit Timah (Ridley); Malacca (Hervey); Selangor, Ginting Bidai (Ridley 7845), Pahang Track (Ridley 8661); Perak, Bujong Malacca (Ridley 9603), Larut Hills (Fox). Distrib. Mauritius, India, Malay isles, Polynesia.

L. scandens Hook. Johor, Sempang Kiri (Ridley), Gunong Pulai (Hullett); Pahang, Kluang Terbang (Barnes); Malacca, Selandau (Goodenough), Sungei Hudang, Machap (Ridley); Perak, Thaiping Hills (Hervey, Wray), Bujong Malacca (Ridley); Penang, Government Hill (Ridley), Richmond pool (Fox). Distrib. Malay isles.

L. orbiculata Lam. Pahang, Tahan River (Ridley); Malacca, Mt. Ophir (Hullett, Ridley 2349); Selangor, Hulu Semangkok (Ridley); Perak, Bujong Malacca (Ridley 9560), Gunong Bubu (Scortechini 133), Thaiping Hills (Ridley); Penang, Government Hill road (Ridley), Richmond Pool (Fox); Kedah Peak (Ridley 5163, 5165).

var. *tenera*. Perak, Gunong Batu Putih (King's Coll. 8039). Distrib. India, China, Australia.

L. Lancea L. Common in woods. "Paku Dudok bukit" "Paku Gurmang." Singapore, Chan Chu Kang (Ridley 1653), Bukit Timah (Ridley 10815); Johor, Gunong Panti (Ridley 4148), Hadji Senawi, Sempang Kiri (Ridley 10967); Malacca, Mt. Ophir (Ridley 3347); Selangor, Batu Tiga (Ridley); Negri Sembilan, Perhentian Tinggi (Ridley), Bukit Danan (Cantley's Coll.); Perak (Scortechini); Tringanu, Bundi (Rostado); Penang, Hill (Hullett); Kedah Peak (Ridley 5164). Distrib. Ceylon, Malay isles, S. America.

L. borneensis Hook. In woods. Singapore, Sungei Jurong (Ridley 9842); Johor, Gunong Pulai (Ridley 12132); Pahang, Tahan River (Ridley); Perak, Thaiping Hills (Ridley 3062). Distrib. Borneo.

L. rigida Sm. On clayey soil in woods. Singapore, Sungei Buluh (Ridley); Malacca, Mt. Ophir, Gunong Mering (Ridley 3350, Griffith, Lobb, Cuming 397); Perak, Bujong Malacca (Curtis 3311), Larut at 2300 to 2500 feet alt. (King's Coll. 3086). Endemic.

L. Walkerae Hook. In water in woods. Singapore, Tampinis (Ridley 26791), Changi (6035); Malacca, Mt. Ophir (Ridley 3333). Distrib. Banka.

L. divergens, Wall. In dry woods common. Singapore, Bukit Timah (Ridley 4231*a*), Bajau (4321), Sungei Morai (1660), Pulau Ubin (Murton); Johor, Gunong Banang (Ridley 10970), Tanjong Kupang; Malacca, Batu Tiga (Derry) and Ayer Panas; Negri Sembilan, Gunong Angsi (Ridley); Perak, Maxwell's Hill (Scortechini 499); Penang Hill (Hullett, Roxburgh); Tringanu, Bundi (Rostado); Kedah Peak (Ridley). Distrib. Borneo.

L. lanuginosa Wall. On trees usually near the sea. Singapore, Jurong (Hullett), Bajau (Ridley 6553) also established in the Botanic Gardens; Perak (Scortechini); Penang (Wallich). Distrib. Africa, Burmah, Australia.

SCHIZOLOMA.

S. lobata Poir. Common in woods. Singapore, Bukit Timah (Ridley 9561); Malacca (Cuming 392); Johor, Gunong Pulai (Ridley 12131); Pahang, Tahan River (Ridley 2168); Perak, Larut Hills (Scortechini, Ridley 10670), Gunong Batu Putih (Wray 292); Penang, Government Hill (Fox). Distrib. India.

S. davallioides, Bl. Common in woods. Singapore, Bukit Timah common; Pahang, Tahan River (Ridley 2179); Malacca, Mt. Ophir (3348, 3351); Negri Sembilan, Gunong Angsi (Ridley); Perak, Larut Hills at 4000 feet (Scortechini 230, 437*a*), Gunong Batu Putih (King's Coll. 8044); Penang Hill; Tringanu, Bundi (Rostado); Kedah Peak (Ridley). Distrib. Malay isles.

S. ensifolia Swartz. Singapore, Chua Chu Kang (Ridley 6033, 6028); Johor, Gunong Pulai (Ridley); Penang Hill. Distrib. Africa, India, Polynesia, Australia.

Sc. heterophylla Dry. *L. Finlaysoniana* Wall. No. 2197. Singapore, Pulau Brani (Hullett); Malacca (Robertson) fide Hooker. Not to be found now, perhaps a garden escape. Distrib. Mauritius, India, Malay isles, Hongkong.

Sc. media Br. Singapore, Pulau Brani (Hullett). Lost like the last. Distrib. Tropical Australia.

Sc. cordata Gaud. "Malay Peninsula" (fide Beddome). Distrib. New Guinea and Rawak.

Sc. Gueriniana Gaud. Malacca (fide Beddome). Distrib. Eastern Malay islands. I have seen no specimens of these last two.

ADIANTUM.

A. caudatum L. Perak, Bukit Kupayiang, Sungei Siput (Ridley), Gunong Tundok (King's Coll. 8351); Selangor, Limestone rocks, Batu Caves (Ridley 8142). Distrib. Tropics of Old World.

A. flabellulatum L. Singapore, Pulau Ubin, on rocks near the sea (Ridley 865), Road side near Changi, a flaccid form on shady banks (Ridley 2680); Malacca, Cape Rachado (Hervey). Distrib. Eastern tropics.

A. Capillus-veneris L. Kedah, Pulau Songsong, an island off the Kedah coast, on rocks by the sea (Ridley 5155). Distrib. Whole World.

A. aethiopicum L. Pahang, Tahan River (Ridley 2173) rocky banks of the river; Penang (Curtis); Malacca (Bishop Hose). Distrib. Africa and South America.

A. lunulatum Burm. Penang, Banks by the road side at Balik Pulau (Ridley 9416) apparently an escape from cultivation; Lankawi (W. Fox). Distrib. Africa, Indo-Malaya, South America.

A. stenochlamys Bak. Singapore, Graves in the old cemetery (Ridley); Malacca, Walls of the old chapel. Distrib. Borneo.

CHEILANTHES.

Ch. tenuifolia Sw. "Paku Telor Belankas," "Paku Resam Padi," "P. Resam Lumut," common on dry banks, etc. Singapore, Pulau Ubin, Sungei Brih (Ridley), also collected here by Norris, Seemann and Wallich; Malacca, Ayer Keroh, Kesang; Negri Sembilan, Seremban; Penang, Penara Bukit, Pulau Tikus; Prov. Wellesley, Tasek Gelugur (Ridley). Distrib. India to Australia and New Zealand.

HYPOLEPIS.

H. punctata Bedd. Perak, Larut (King's Coll. 5015).

PTERIS.

Pt. longifolia, L. Common on walls and dry spots, "Paku Uban Bukit." Singapore, on the aqueduct near the Reservoir, etc.; Johor, Batu Pahat (Ridley); Malacca, on the old chapel, Mt. Ophir (Ridley); Selangor, Batu Caves (Ridley 8145); Perak, Kuala Dipang (Ridley 9549), Bukit Kupayiang, Sungei Siput (Ridley); Penang (Ridley 7079); Tringanu, Bundi (Rostado). Distrib. Whole World.

Pt. cretica L. Rather rare, usually a peculiar grey form. Johor, Gunong Pulai (Ridley, Hullett); Perak, Upper Perak (Wray 3699); Penang Hill (Hullett); Lankawi, Gunong Rayah (Curtis 3381); Selangor, Pahang Track (Ridley). Distrib. Europe, Africa, Asia and America.

P. Grevilleana Wall. Pahang, Pekan (Ridley 2163); Perak, Tambuan near Ipoh (Ridley). Distrib. India.

Pt. ensiformis Burm. Common in dry spots, sometimes in burnt up lalang fields, "Paku Padang." Singapore, Garden Tanglin, Bukit Timah (Ridley), Pulau Ubin (Murton); Johor, Tanjong Bunga (Ridley 6549); Malacca, Bukit Panchur (Cantley), Selandau, Sungei Udang (Derry); Negri Sembilan, Seremban (Ridley 9877); Penang (Bishop Hose); Kedah (King's Coll. 1744); Tringanu, Bundi (Rostado).

var. A very stunted tufted plant growing between stones in streams on Gunong Mering, Ophir (Ridley 3340) and on Kedah Peak at 3000 feet altitude (Ridley 5165). Distrib. Type Indo-China, Australia.

Pt. semipinnata L. "Paku medang," "Paku Pelandok." Malacca, Alor Gajah (Hervey); Pahang, near Pekan (Ridley); Selangor, Ginting Bidai (Ridley 7838); Sungei Ujong (var. *dispar*) (Hullett); Perak, Upper

Perak (Wray 3528); Kinta River (King's Collector 830). Distrib. Malaya, Chino-Japan.

Pt. Dalhousiae Hook. Perhaps only a fine form of *Pt. semipinnata*. It was first found by Lady Dalhousie in Penang, but was not seen there again till it was rediscovered by Mr. Curtis on rocks, near Mt. Erskine where the original Government house was, and where doubtless Lady Dalhousie found it. Malacca, Hulu Belangkas (Derry 1082), Bukit Besar, Mt. Ophir (Ridley 9867); Selangor, Langat (Ridley 1681); Penang (Lady Dalhousie), Penara Bukit (Curtis 635, Ridley 7270). Endemic.

Pt. quadrianuita Retz. Singapore, Serangoon Road (Ridley); Johor, Batu Pahat, Patani (Ridley); Malacca, Pulau Undan (Cantley), Bukit Panchur; Selangor, Batu Caves (Ridley 8153), Petaling; Perak, Tambun, Ipoh (Ridley 9543), Goping (King's Coll. 524). Distrib. all the tropics.

Pt. patens Hook. Malacca (Hervey); Selangor, Caves, Kuala Lumpur (Ridley 8640) and 15th mile Pahang Track; Perak, Upper Perak (Wray 3706); Lankawi, Foot of Gunong Raya (Fox). Distrib. Indo-Malaya, Polynesia.

Pt. longipinnula Wall. Perak, Upper Perak (Wray 3741). Distrib. Indo-Malaya.

Pt. aquilina L. Common all over the Peninsula, usually in sandy soil, from the plains to 1000 feet elevation or more. The most remarkable forms are a very pubescent one. Selangor, Bukit Kutu (7837) and a variety with very long pinnules found in Malacca by Mr. Hardy. Distrib. the whole world.

CAMPTERIA.

C. biaurita L. Singapore, Serangoon Road (Ridley); Dindings, Bruas (Ridley 7268); Penang, Penara Bukit (Ridley 6946). Distrib. Tropics old world.

DORYOPTERIS.

D. ludens Wall. Selangor, Limestone rocks at the Caves (Ridley 8135); Perak, Batu Kurau (Scortechini 507). Distrib. Indo-Malaya.

The Selangor form is a very curious one with thick ovate cordate quite obtuse sterile fronds and all the pinnules of the fertile ones narrow and entire.

LITOBROCHIA.

L. incisa Thunb. Singapore, Tanglin, Holland Road; Johor, Tanjong Kupang (Ridley); Perak (Scortechini 471), Larut (King's Coll. 2363, Scortechini 102, 419), Maxwell's Hill abundant.

var. *integrifolia*. Grows with the ordinary form on Maxwell's Hill. Distrib. all tropics.

L. marginata Bory. Malacca (fide Beddome); Selangor, Batu Caves, Kwala Lumpur (Ridley 8146), Bukit Kutu (Ridley 7836). Distrib. Africa, Asia, Australia, Polynesia.

CERATOPTERIS.

C. thalictroides L. In ditches. This plant has a habit of disappearing altogether at certain times of the year and reappearing in abundance. Singapore, Gardens, Ang Mo Kio, Seletar, Changi (Ridley 4227); Pahang, Pekan (Ridley 1509); Malacca (Hervey); Selangor, Bukit Bintang (Goodenough); Penang, Tanjong Bunga (Curtis); Kelantan, Kamposa (Ridley); Lankawi isles (Curtis). Distrib. whole world tropics.

LOMARIA.

L. procera var *vestita*. Perak, Gunong Batu Putih (3-4000 feet) (King's Coll. 8065).

PLAGIOGYRIA.

P. pycnophylla Kze. Larut 5-5500 feet alt. near top of Gunong Bubu (King's Coll. 7324). Distrib. Indo-Malaya.

P. euphlebia Kze. Perak, Gunong Bubu (Wray 3852). Distrib. India, Japan, Australia.

BLECHNEAE.

BLECHNUM.

B. serrulatum Rich. Singapore, Serangoon Road (Ridley 10917); Malacca (Hervey), Ching (Derry); Pahang, Pekan (Ridley 2160*a*). Distrib. Malaya, Australia, America.

B. orientale L. Very common in open country "Paku Ular," Paku Ikan." Singapore, Tanglin, Bukit Timah; Johor, Batu Pahat, Gunong Pulai (Ridley 3750); Malacca, Pulau Besar; Negri Sembilan, Bukit Berumbang (Cantley), Seremban (Ridley 9875); Penang Hill (Ridley). Distrib. Indo-Malaya, China, Australia.

B. Finlaysonianum Wall. Singapore, Chan Chu Kang (Ridley 6121), Reservoir Woods (Ridley 4821); Malacca, Sungei Hudang (Derry); Selangor, 15th mile Pahang Track (Ridley 8656); Pahang, Tahan River (Ridley). Endemic.

SADLERIA.

S. cyatheoides, Kaulf. Perak (Day) fide Beddome.

ASPLENIEAE.

THAMNOPTERIS.

Th. nidus L. Common everywhere on trees. The bird's nest fern. It is supposed to be the home of the demon known as the Langsuir. There are several forms.

var. *musaefolia* Mett. The form with long broad leaves, 6 feet or more long a foot wide.

var. *phyllitidis* Don. Leaves narrow 2- feet long 2-3 inches wide. A crested form also occurs. Distrib. Indo-Malaya, Mascarenes.

ASPLENIUM.

A. Scortechini Bedd. Perak (Scortechini 128), Maxwell's Hill (Ridley 5186). Endemic.

A. Mactieri Bedd. Penang (Mactier) (fide Beddome) not seen.

A. squamulatum Bl. On rocks and stumps in wet woods common, bulbiferous at the extremity of the fronds. Singapore, Bukit Timah on rocks, Chua Chu Kang, etc.; Johor, Batu Pahat, Hadji Senawi (Ridley 10964), a curious branched form, Tanjong Kupang; Perak, Larut (King's Coll. 6320), Maxwell's Hill (Ridley). Distrib. Malay islands.

A. normale Don. Perak, Larut (King's Coll. 2705). Distrib. India, China.

A. subavenium, Hook. Penang (Beddome). Distrib. Madagascar.

A. amboinense Willd. Perak, Thaiping (Scortechini). Distrib. Malay isles.

A. longissimum Bl. On trees and rocks not rare. Singapore, Mandai (Ridley 10930), Bukit Timah abundant (10810), Tanglin on trees in the Gardens; Prov. Wellesley, Bukit Panchur (Native Collector); Pahang, Pekan (Ridley); Malacca (Hervey), St. John's Hill (Derry); Dindings, Bruas (Ridley); Perak, Larut (King's Coll. 2550). Distrib. Mascarene isles, Indo-Malaya.

A. Wightianum Wall. On rocks. Sungei Ujong (Hullett); Perak (King's Coll. 8130, 10959). Distrib. Indo-Malaya.

A. *sumatrana* Hook. On rocks. Johor, Batu Pahat (Ridley 11067); Selangor, Ginting Bidai (Ridley 7841); Dindings, Pangkor (Ridley); Penang, Penara Bukit (Ridley 7074). Distrib. Malaya.

A. *tenerum* Forst. On trees and rocks. Singapore, Bukit Timah, Ang Mo Kio (Ridley); Johor, Batu Pahat; Pahang, Pulau Tawar (Ridley); Selangor, Pahang Track (Ridley), Gunong Hitam (Goodenough), Bukit Rutu (Ridley 7847); Perak (Scortechini); Penang, Government Hill. Distrib. Ceylon, Malaya, Polynesia.

A. *lunulatum* Sw. Perak, Maxwell's Hill (Ridley), Gunong Batu Putih (King's Coll. 8043). Distrib. India.

A. *boneense* Hook. Perak, Bujong Malacca (Curtis 3312, Ridley 9553), Larut (King's Coll. 1998). Distrib. Malaya.

A. *hirtum* Kaulf. Pahang, Tahan (Ridley); Penang, Government Hill. Distrib. Indo-China, Malaya, Polynesia.

A. *falcatum* Lam. Singapore, Bukit Timah (Hullett). Distrib. Africa, India, Australia.

A. *macrophyllum* Sw. Rocks and trees. Singapore, Pulau Ubin (Kunstler), Sungei Buluh, Chan Chu Kang, Bukit Timah; Selangor, Batu Caves; Negri Sembilan, Perhentian Tinggi; Prov. Wellesley, Bukit Panchur; Perak (Scortechini 1079); Penang, Bukit Erskine (Curtis), Balik Pulau (Ridley). Distrib. of the last.

A. *caudatum* Forst. Perak, Larut (King's Coll. 2351), Caulfield's Hill (Scortechini 390). Distrib. Africa, India, Australia, S. America.

A. *dimidiatum,* Sw. Perak, Goping (King's Coll. 432). Distrib. W. Indies.

A. *cuneatum* Lam. Perak (Scortechini), Bujong Malacca (Ridley 9546). Distrib. all the tropics.

A. *melanophyllum* Scort. Perak, Gunong Bubu (King's Coll. 7403). Endemic.

A. paradoxum Bl. Penang (fide Beddome); Perak, Kinta (King's Coll. 7164). Distrib. Malaya.

A. heterocarpum, Wall. Sungei Ujong (Hullett). Distrib. India, China, Malaya.

A nitidum Sw. On rocks and trees. Singapore, Bukit Timah; Johor, Gunong Pulai (Hullett), Hadji Senawi, Batu Pahat (Ridley 10965); Pahang, Tahan River, Pulau Tioman; Selangor, Batu Caves (Ridley 8144); Perak, Goping (King's Coll. 8180) var. *obtusatum.* Distrib. Africa, Indo-Malaya.

A. unilaterale Lam. *A. resectum* Hook. Pahang, Tahan River (Ridley); Malacca, Jeram Nyalas (Derry); Selangor, Batu Caves (Ridley 8286, 8649), 15 mile Pahang Track; Perak, Gunong Batu Putih (Wray 1010), Thaiping Cottage (Hervey). Distrib. Africa, Indo-Malaya, Japan Polynesia.

A. Belangeri Kze. Perak, Thaiping Hills (Scortechini, Hervey); Penang, Government Hill (Fox). Distrib. Malaya.

A.bulbiferum Forst. Penang (fide Beddome probably cultivated).

ATHYRIUM.

A. Ridleyi Christ. Malacca, Bukit Besar, Ophir (Ridley 9866). Endemic.

DIPLAZIUM.

D. subserratum Bl. Hills at about 3000 feet elevation. Selangor, Ginting Bidai (Ridley); Perak, Maxwell's Hill (Ridley); Penang Hill. Distrib. Java.

D. larutense, Bedd. Larut (King's Collection 1913). Endemic.

D. pallidum Bl. Singapore, Toas (Ridley); Pahang, Tahan River (Ridley 2167); Sungei Ujong (Hullett). Distrib. Burmah to Malaya.

D. *porrectum* Wall. Common in woods "Paku Naga." Singapore, Chan Chu Kang (Ridley 4399), Holland Road (5700), Reservoir Woods, Garden Jungle; Johor, Batu Pahat (Ridley 10978), Gunong Pulai (3751); Malcaca, Batu Tiga (Derry 985), Ayer Panas (Derry 16); Pahang, Tahan River (Ridley); Negri Sembilan, Gunong Angsi (Ridley 9868), Sungei Ujong (Hullett); Selangor, Pahang Track (Ridley 8648); Perak, Larut (King's Coll. 2255), Ulu Kul (10503) and Batang Padang; Kedah, Gunong Jerai (Ridley). Distrib. Malaya.

D. *sylvaticum* Presl. Singapore (Hullett); Pahang, Tahan River (Ridley 5818); Malacca, Ayer Panas (Hervey); Selangor, Batu Caves, Bukit Kutu (Ridley 7844); Perak, Kinta (King's Coll. 7146), Thaiping (Scortechini), Maxwell's Hill (Fox); Penang Hill (Hullett). Distrib. Africa Indo-Malaya.

D. *bantamense* Bl. var. *Prescottianum*. Singapore (Hullett); Malacca, Ayer Keroh and Ayer Panas (Ridley); Selangor, Ginting Peras (Ridley 7031); Perak, Maxwell's Hill (Fox), Larut (King's Coll. 2698); Penang Hill. Distrib. Indo-Malaya, China.

D. *speciosum* Mett. D. *acuminatum* Bl. "Paku Kijang." Singapore, Serangoon Road (Ridley 8937), Garden Jungle, Stag Mount (11271), Reservoir Woods (12202); Johor, Gunong Pulai (Ridley 12130); Malacca, Ayer Panas (Derry); Selangor, Batu Caves; Dindings, Gunong Tungul (Ridley 7271); Kedah, Gunong Jerai (Ridley 5166). Distrib. India.

D. *tomentosum* Hook. In woods, terrestrial, "Paku Binet." Singapore, Bukit Timah; Pahang, Tahan River; Selangor, Labu River, Petaling, Sungei Ujong, Bukit Sulu (Cantley's Coll.); Perak, Goping (King's Coll. 658), Thaiping Hills (King's Coll. 11428). Distrib. Burma, Malaya.

D. *chlorophyllum* Bak. Penang (Curtis). Endemic.

D. sorzogonense Presl. Singapore, Selitar (Ridley 6557); Pahang, Tahan River (Ridley); Perak, Larut (King's Coll. 2532), Kinta (King's Coll. 7151), Thaiping (Scortechini).

var. *major* Bedd. Perak, Gunong Bubu (King's Coll. 7403). Distrib. Malaya.

D. asperum Bl. *D. polypodioides.* var. *asperum.* Malacca (Hervey); Perak (Scortechini), Ulu Bubong (King's Coll. 10849).

var. *polypodioides.* Pahang, Kuala Tahan (Ridley 2400); Penang abundant (Curtis). Distrib. Indo-Malaya.

D. latifolium Don. Selangor, 15th mile Pahang Track (Ridley 8652); Perak, Larut (King's Coll. 2214, 2346), Gunong Bubu (King's Coll. 8420). Distrib. Indo-Malaya, Australia.

ANISOGONIUM.

A. lineolatum Mett. Perak (Scortechini), Gunong Batu Putih (King's Coll. 8026); Penang Hill (Hullett). Distrib. Malaya.

A. cordifolium Mett. Woods, terrestrial, "Paku Tunjok Langit." Singapore, Bukit Timah (Ridley 5867); Selangor, Kuala Lumpur; Negri Sembilan, Kupaiyiang (Cantley's Coll.); Perak, Larut (King's Coll. 2711), Cottage, Thaiping Hills (Hervey). Distrib. Malaya.

A. decussatum Sw. Rare. Perak, Thaiping Hills, Gunong Hijau (Ridley), Birch's Hill (Day). Distrib. Malaya.

A. esculentum. "Paku Anjing." Common on stream banks, leaves eaten as spinach. Singapore, Stream along Bukit Timah Road; Selangor, Dusun Tua (Ridley 7863); Pahang, Pulau Manis (Ridley); Negri Sembilan, Seremban; Perak (Scortechini 437). Distrib. Indo-Malaya, China.

ASPIDIEAE.

DIDYMOCHLAENA.

D. lunulata Desv. Selangor, 15th mile Pahang Track (Ridley 8659); Perak, Gunong Chey at 2600 feet (Murton), Gunong Keledang (Ridley 9538), Thaiping Hills (Scortechini, Ridley). Distrib. Burma, Malaya, Mascarene, Polynesia, America.

MESOCHLAENA.

M. polycarpa Bl. Woods "Paku Surai." Singapore, Bukit Timah (Ridley 1658); Pahang, Pulau Padang (Ridley 2401) and Tahan River (2396); Negri Sembilan, Bukit Sumaiyiang (Cantley's Coll.); Perak, Thaiping (Scortechini 464), Goping (King's Coll. 371) and Gunong Bintang (243). Distrib. Malaya.

POLYSTICHUM.

P. semicordatum Sw. Pahang, Tanjong Antan, Pahang River (Ridley); Perak, Kuala Dipang (King's Coll. 8282). Distrib. Malaya, Burma, Tropical America.

P. aculeatum var. *biaristatum* Sw. Perak, Larut 2500 to 3000 feet alt. (King's Coll. 6258); Penang, Richmond Pool. Distrib. of type whole world.

ASPIDIUM.

A. singaporianum Wall. Woods common, "Paku Todak, Paku Biawak, Paku Murak." Singapore, Bukit Timah, Chua Chu Kang, etc. (Ridley); Pahang, Tahan River; Malacca, Jasin, Sungei Hudang (Derry); Sungei Ujong, Bukit Sulu, Gunong Berumbun (Cantley's Coll.); Selangor, Kuala Lumpur (Curtis), Bukit Kudah (Ridley); Perak, Ipoh; Tringanu, Bundi (Rostado); Penang Hill. Distrib. Malaya.

A. *Kunstleri* Bedd. Perak, Goping (King's Coll. 405). Endemic.

A. *tricuspe* Bedd. Perak, Goping (King's Coll. 975). Endemic.

A. *vestum* Bl. Woods "Paku Jari." Johor, Batu Pahat (Ridley 10669); Pahang, Tembeling River (Ridley 2399); Selangor, Batu Tiga, Batu Caves (Ridley); Perak, Kota Bahru (King's Coll. 382); Penang (Bishop Hose). Distrib. India, Malaya.

A. *angulatum* Sm. Singapore, Bukit Timah (King's Coll. 342), Bukit Panjang (Ridley 12534); Perak (Scortechini), Goping (King's Coll. 580, 586).

A. *semibipinnatum* Wall. In tidal river mud. Johor, Castlewood (Ridley 12225), Gunong Pulai (Hullett); Muar, Sungei Segal (Ridley 12278); Perak (Scortechini); Penang (fide Beddome). Distrib. Malaya.

A. *subtriphyllum,* Hook. Perak, Goping (King's Coll. 4713), Tambun near Ipoh (Ridley 9542).

A. *variolosum* Wall. Singapore, Bajau (Ridley 2419), Bukit Mandai, Bukit Timah (9566, 8939); Johor, Gunong Pulai (Ridley 12129); Selangor, Bukit Kudah (Ridley 1684), Batu Caves (8148), Langat (1685); Perak, Goping (King's Coll. 5908); Penang (King's Coll. 4862), Waterfall (Curtis 1608). Distrib. India.

A. *polymorphum,* Wall. "Paku Kikir." Selangor, Kuala Lumpur (Ridley 2409); Sungei Ujong (Hullett), Bukit Sulu (Cantley's Coll.); Perak, Larut (King's Coll. 2289, 2395). Distrib. Africa, India, Malay isles.

A. *repandum* Willd. Perak, Larut (King's Coll. 6305). Distrib. Malaya.

A. *pachyphyllum* Kze. Perak, Larut (King's Coll. 1816, 2347), Maxwell's Hill (Scort. 218, 493). Distrib. Malaya.

A. decurrens Presl. Perak, Bujong Malacca (Ridley 9535); Tringanu, Bundi (Rostado). Distrib. India, Malaya, China, Polynesia.

A. cicutarium Sw. Woods, "Paku Larat," "Paku Sagala," "Paku Tembaga." Singapore, Bukit Timah, Pulau Ubin (Ridley 4396); Johor, Batu Pahat (Ridley 10976)); Malacca, Sungei Hudang; Sungei Ujong, Bukit Payong, Bukit Danan (Cantley). Distrib. all tropical countries.

A. multicaudatum Wall. Perak, Larut (King's Coll. 2297), Upper Perak (Wray 3604).

A. ternatum Bak. Pahang, Pekan (Ridley). Distrib. Borneo.

Pleocnemia.

P. membranifolia Presl. Selangor, Batu Caves (Ridley 8149); Pahang, Tahan River (Ridley); Perak, Goping (King's Coll. 5871). Distrib. India.

P. membranacea Hook. Selangor, Batu Caves (Ridley 8140, 8136, 8643); Perak Scortechini). Distrib. Malaya, China.

P. Lenzeana Hook. Singapore, Cascade Valley, Bukit Timah (Matthew); Malacca (Cantley); Perak, Larut (King's Coll. 2093), Goping (720). Distrib. Indo-Malaya, China, Australia.

P. gigantea Bl. Singapore, Bukit Timah (Ridley); Negri Sembilan, Tampin (Goodenough); Penang, Pulau Butong (Curtis 3401).

P. megalocarpa Hook. Perak, Larut 2-3000 feet alt. (King's Coll. 2236). Distrib. Java.

Lastrea.

L. gracilescens Bl. Rare. Perak (Scortechini). Distrib. India, China, Malaya.

L. immersa Bl. In Woods. Pahang, Kuala Tahan (Ridley); Selangor, Bukit Kutu (Ridley 7848) at the Batu Caves and on the Tras route (8658); Perak, Batu Gajah, Kul (King's Coll. 10502). Distrib. Malay islands.

L. calcarata Bl. Hill woods. Pahang, Tahan River (Ridley).

var. *sericea*. Larut (King's Collector 1571).

var. *ciliata*. Kedah, at Yan (Ridley 5161). Distrib. India.

L. (Dryopteris) Ridleyi Christ. Perak, Bujong Malacca (Ridley 9600); Pahang, Kuala Tahan; Malacca, Base of Mt. Ophir; Selangor, Bukit Hitam (Ridley 7849).

This plant was identified first as *L. viscosa* by Dr. Christ, later he distinguishes it as a species. It much resembles *L. calcarata* in many points. The first number quoted is that of the type. The other plants seem to me to be identical with it.

L. unidentata Bedd. Perak, Gunong Bubu (King's Coll. 7434). Endemic.

L. Thelypteris Desv. Rare. Perak, Tea Gardens (Ridley 3058). Distrib. Europe, Asia, S. Africa, New Zealand.

L. crassifolia Bl. Common "Paku Knau." Singapore, Sungei Morai (Ridley 4397), Bukit Panjang (12532); Johor, Tanjong Kupang (Ridley 6556); Malacca, Sungei Hudang (Goodenough), Ulu Bumban (Hervey), Gunong Mering, Ophir (Ridley 3335); Pahang, Kota Glanggi (Ridley 2159); Selangor, Pahang Track (Ridley 8654); Perak, Larut (King's Coll. 3814), Maxwell's Hill (Scortechini 221); Penang (Ridley).

L. ochthodes Kze. Singapore, Chan Chu Kang (Ridley 9843); Penang, Balik Pulau (Ridley 9579).

L. Dayi Bedd. Singapore (Bishop Hose); Penang (Matthew); Perak, Maxwell's Hill (Day, Kunstler 2126). Endemic.

L. singalanensis Bak. Perak, Thaiping (King's Coll. 3520, 8520).

L. fuscipes Wall. Singapore, Bukit Timah (Ridley 5874); Perak, Ulu Kerling (King's Coll. 8742), Upper Perak (Wray 3712). Distrib. Burma, Malaya.

L. padangensis Beddome. River bank close to water's edge. Perak, Batang Padang, Padang River (King's Coll.). Endemic.

L. syrmatica Willd. Perak, Goping (King's Coll. 8178); Penang, Penara Bukit (Ridley). Distrib. Indo-Malaya.

L. tenericaulis Wall. Penang (King's Coll. 1493); Singapore, established in Tanglin. Distrib. India, China, Australia.

L. intermedia Bl. Perak (Day); Penang (Curtis).
var. *Blumei*. Perak (Scortechini), Larut (King's Coll. 6952).

L. megaphylla Bak. Perak, Larut at 3000 feet alt. (King's Coll. 2822, 6952, 2822).

NEPHRODIUM.

N. unitum L. Damp spots, "Paku Hudang." Singapore, Selitar (Ridley 4394), Galang (4392); Malacca, Ayer Panas; Perak, at sea level (Day, King). Distrib. All tropics.

N. pteroides Retz. *N. terminans* Wall. Singapore, Bukit Timah; Johor, Bukit Soga, Batu Pahat (Ridley 10973); Dindings, Pulau Sembilan (Ridley 3145); Perak, Maxwell's Hill (Ridley 5187); Lankawi (Ridley 8346). Distrib. Indo-Malaya.

N. extensum Bl. Penang Hill (Ridley). Distrib. Indo-Malaya.

N. cucullatum Bl. Singapore, behind the General Hospital (Ridley), Chan Chu Kang, Changi 3596*a*, 2602); Malacca, Bukit Bruang; Negri Sembilan, Seremban (Ridley 9873). Distrib. Mascarene, Indo-Malaya, Polynesia.

N. aridum Don. Singapore, Jurong, Kranji (Ridley), Green Hill (Hullett); Johor, Castlewood (Ridley); Pahang, Pekan (Ridley); Perak (King 1025). Distrib. India.

N. glandulosum Hook. Perak, Ulu Kerling (King's Coll. 8660). Distrib. Java.

N. lineatum Bl. Perak (Day, Scortechini, King's Coll. 497). Distrib. Malaya.

N. urophyllum Wall. Common in woods, "Paku Gajah," "Paku Merah." Singapore, Bukit Timah (Ridley 5870); Malacca, Bukit Besar, Mt. Ophir (Ridley), Bukit Bruang (Derry 681); Pahang, Temerloh, Kota Glanggi, Tahan River (Ridley 2398); Sungei Ujong, Bukit Danan (Cantley's Coll.), Bukit Putus (Ridley); Selangor, Batu Caves (Ridley 8154), Ginting Bidai (7839); Perak, Slim (King's Coll.), Upper Perak (Wray 3592); Penang Hill (Ridley); Lankawi, Gunong Raya (Curtis). Distrib. Indo-Malaya.

var. *Pinwillei*. Malacca (Pinwill); Perak (Day).

N. moulmeinense Bedd. Johor, Gunong Pulai (Ridley 12123).

N. costatum Wall. *Polypodium penangianum* Hook. Penang (Beddome). Distrib. India.

N. pennigerum Bl. Singapore, Rifle Range (Ridley); Johor, Pinerong (Cantley); Selangor, Dusun Tua (Ridley 7861); Perak, Maxwell's Hill (Scortechini 237); Penang Hill (Hullett).

var. *Malayense*. Perak (Scortechini, Day, King's Coll. 2360). Distrib. Indo-Malaya, Africa.

N. molle Desv. Singapore, common Selitar (Ridley 4395), Chan Chu Kang (6120), Bukit Timah (5893), Changi (6037), Pulau Brani (Hullett); Johor, Castlewood (Ridley); Selangor, Bukit Hitam (Ridley 7854); Perak, Ulu Bubong (King's Coll. 10127), Ulu Kerling (8657); Penang (King's Coll. 1570). Distrib. whole world.

N. amboinense Presl. Singapore, Green Hill (Hullett); Pahang, Khol, Tembeling River (Ridley); Selangor, Dusun Tua; Perak, Telok Pinang (Ridley 539), Bernam River (King 8800). Distrib. Indo-Malaya.

N. tectum (Wall.) Singapore (Wallich 394 and 354 past), Bukit Timah (Ridley 9567); Perak, Ulu Kerling (King 86507), Ulu Bubang (10157? 1205, 8757).

N. crinipes Hook. Perak (Scortechini, King's Coll. 7126). Distrib. India.

N. ferox Moore. Hill forests. Selangor, Ginting Peras (7854); Perak, Larut (King's Coll. 4064); Penang Hill (Ridley 7080). Distrib. India, Malaya.

N. Ridleyi Christ. Selangor, 15th mile Pahang Track (Ridley 8655); Perak, Bujong Malacca (Ridley 9536). Endemic. This very closely resembles *N. ferox.*

N. truncatum Presl. Singapore, Sungei Jurong (Ridley 10774); Johor, Batu Pahat; Selangor, Batu Caves Ridley 8137); Perak, Telok Pinang (Ridley 9540) and Tambun (9544), Goping (King's Coll 556), Maxwell's Hill (Scortechini); Penang, Waterfall (Curtis).

var. *subintegra* Christ. Penang (Ridley 10136). Distrib. Indo-Malaya, Australia.

N. brachyodon Hook. Perak, Maxwell's Hill (Scortechini 221), Bujong Malacca (Ridley 9537). Distrib. West Indies and Peru.

N. sakayense Zeiller. Perak, Valley of Kiang River near Riam Mountain (Scortechini). Endemic.

N. heterocarpm Bl. Singapore, Green Hill (Hullett); Negri Sembilan, Perhentian Tinggi (Ridley 9869); Perak, Larut (Scortechini, King's Coll. 6345); Penang Hill (Ridley 9225).

N. larutense Bedd. Selangor, Rawang (Ridley 7850), 15th mile Pahang Track (Ridley 8632); Perak (Day, King's Coll. 850, 2398).

N. glaucostipes Bedd. Perak, Larut (King's Coll. 2046). Endemic.

N. perakense Bedd. Perak, Thaiping Hills, Birch's Hill (Day). Endemic.

N. Haenkeanum Presl. Singapore, Bukit Mandai (Ridley 1655), Bukit Timah (Matthew).

NEPHROLEPIS.

N. exaltata L. Very common in open country. "Paku Pinang." Singapore, Holland Road, Ang Mo Kio (Ridley); Malacca, Pulau Besar, Lubok Kedondong, St. John's Hill (Ridley); Selangor, Kuala Lumpur (Ridley, a curious crested form); Perak, Bujong Malacca (Ridley 9607), Larut (King's Coll. 5220); Penang Hill (Ridley 7038).

var. *hirsutula*. Singapore, Tanglin; Malacca (Hervey).

var. *pilosula*. Selangor, Kuala Lumpur (Ridley 2408). Distrib. Tropics of old world.

N. volubilis Smith. "Paku Baging," "Paku Racha," "Paku M'rah," "Paku Ningek." Climbing on trees in damp spots. Singapore, Rochor, Sungei Morai (Ridley 4405); Johor, Tanjong Kupang (Ridley); Malacca, Ayer Keroh, Jus (Goodenough); Perak, Batu Kurau (Curtis); Dindings, Pulau Sembilan (Ridley); Tringanu, Bundi (Rostado); Lankawi, Kwah (Curtis). Distrib. India, Malaya.

N. acuta Presl. Johor, Tanjong Kupang; Pahang, Tahan River (Ridley 2373); Selangor, Batu Caves; Perak (Wray 2826, King's Coll. 165, 4955).

var. *lancifolia* Christ. Malacca, Pulau Besar (Ridley 2422). Distrib. Africa, India.

N. davallioides Kze. Selangor, Bukit Hitam (Ridley); Perak, Thaiping (Scortechini), Larut (King's Collectors 6325 and 5007). Distrib. Java.

OLEANDRA.

O. neriiformis Cav. Common from 3000 feet and upwards. Malacca, Mt. Ophir; Selangor, Bukit Hitam (Ridley 7832), Ulu Semangko; Perak, Ulu Batang Padang (Wray 1601), Thaiping Hills Cottage (Hervey, Wray, etc.); Kedah, Gunong Jerai (forming dense thickets) (Ridley); Lankawi (Curtis). Distrib. India, America.

O. Cumingii Sm. Kedah Peak (Ridley 5172) with the variety *longipes*. Distrib. Burmah, China, Malaya.

O. musaefolia Kze. Perak (Scortechini). Distrib. India.

POLYPODIEAE.

PHEGOPTERIS.

P. punctatum, Thunb. "Paku Resam Paya." Fronds used for poulticing boils. Selangor, Ginting Bidai (Ridley 7867); Perak, Larut (King's Coll. 5015, Scortechini), Caulfield's Hill (Scortechini 396), Maxwell's Hill (Fox); Malacca, Bukit Kanding (Cantley's Coll.); Penang, Balik Pulau (Ridley 9470). Distrib. Tropics and subtropics.

P. Kingii Bedd. Perak, Larut (King's Collector 2250). Endemic.

P. laserpitiifolia Scort. Perak (Scortechini, King's Coll. 2208). Endemic.

DICTYOPTERIS.

D. Barberi Hook. Common in woods. Singapore, Bukit Timah (Ridley 10778); Malacca (Beddome); Selangor, Rawang (Ridley 7840). Distrib. Malaya.

D. difformis Bl. "Paku Siar." Malacca (Hervey); Pahang, Tanjong Antan, Pahang River (Ridley); Negri Sembilan, Seremban (Cantley's Coll.); Selangor, 15th mile Pahang Track (Ridley 8631); Perak (Scortechini). Distrib. Burma, Malaya.

D. polycarpa Mett. Malacca (fide Beddome) who says however he has not seen this species and doubts if there is a specimen in Europe. (*Dictyopteris heterosora* Baker is *Aspidium vastum*).

POLYPODIUM.

§ 1. Fronds entire.

P. parasiticum Mett. Malacca, Mt. Ophir (Hullett); Penang Hill (Fox). Distrib. India.

P. subevenosum Bak. Johor, Gunong Pulai; Gunong Pantai (Ridley); Malacca, Mt. Ophir (Hullett, Ridley 8961); Pahang, River Ban Tahan (Ridley); Perak (Scortechini) Endemic.

P. hirtellum, Bl. Malacca, Mt. Ophir, Gunong Mering (Ridley 3354); Perak (Scortechini), Tea Gardens, Thaiping Hill (Ridley), Gunong Brumber; Pahang (Wray 1553). Distrib. Ceylon, Malaya.

P. sessilifolium Hook. Penang Hill (Ridley 10172, 7134). Distrib. Malaya.

P. universe Bak. Richmond Pool (Matthew); Penang (Curtis). Endemic.

P. Ridleyi Christ. A very small plant with entire fronds thin and undulate when dry; on knots on *Baccaurea parviflora* on Gunong Pulai, Johor (Ridley 12136).

P. adspersum Bl. Singapore (Lobb), probably wrongly localised.

P. setigerum Bl. Singapore (Moore's Herbarium).

§ 2. Fronds lobed.

P. trichomanoides Sw. Malacca, Mt. Ophir, Mering (Ridley 9863) "forma fronde glabra, soris subterminalibus" (Christ); Selangor, Hulu Semangkok (Ridley 12035). Distrib. India, Africa.

P. *cucullatum* Nees. Malacca, Mt. Ophir (Hullett); Pahang. Kluang Terbang (Barnes); Selangor, Bukit Kutu (Ridley 7877); Perak Bujong Malacca on rocks in a stream (Ridley 9612). Distrib. Ceylon.

P. *triangulare* Scort. Perak (Scortechini), Gunong Batu Putih (Wray 294). Endemic.

P. *cornigerum* Bak. Perak, Thaiping Hills, Gunong Hijau (Day, Scortechini). Distrib. Ceylon.

P. *streptophyllum* Bak. Singapore (Murton) not seen since.

P. *Khasyanum* Hook. Johor, Gunong Pulai (Hullett); Perak at 4000 feet alt. (Day). Distrib. India.

P. *obliquatum* Bl. Perak, Larut at 3-3500 feet alt. (King's Coll. 2094), Thaiping Hills (Scortechini, Hervey). Distrib. India.

P. *nutans* Bl. Malacca, Mt. Ophir on trees (Moore's Herbarium). Distrib. Java.

P. *subfalcatum* Bl. Perak, at 3-4000 feet (Scortechini, Day). Distrib. India.

P. *decorum* Brack. On trees in mangrove swamps, and on mountain tops. Singapore, Kranji (Ridley); Johor, Gunong Panti, Gunong Pulai, (Ridley 3704) and Tanjong Bunga; Malacca, Mt. Ophir, and Gunong Mering (Ridley 3342 and 3343); Perak, Gunong Keledang (Ridley 9558); Penang Hill; Kedah Peak (Ridley). Distrib. Indo-Malaya, Polynesia.

P. *malaccanum* Baker. Malacca, Mt. Ophir, Gunong Mering (Ridley 3345), Gunong Ledang (9884). Endemic.

P. *fuscatum* Bl. Perak (Scortechini), Gunong Bubu (Wray); Kedah Peak (Ridley).

P. *alternidens* Cesati. Malacca, Mt. Ophir (Ridley 9862); Perak, Thaiping Hills, Tea Gardens (Ridley). Distrib. Borneo.

P. *subpinnatifidum* Bl. Perak, Gunong Kerbau (De Morgan). Distrib. Java, Polynesia.

P. papillosum Bl. Perak, Larut (King's Coll. 1994), Gunong Haram Parah (Scortechini 665), Kinta on limestone rocks 500 to 1000 feet alt. (King's Coll. 7206). Distrib. Malaya.

P. tenuisectum Bl. Perak (Scortechini). Distrib. Java.

GONIOPHLEBIUM.

G. subauriculatum Bl. Perak (Scortechini); Selangor, Semangkok Pass (Ridley 12033, differs in its pinnules being sessile and somewhat decurrent). Distrib. Indo-Malaya, Australia.

G. verrucosum Wall. Common in open country. Singapore, Pasir Panjang, Bukit Mandai (Ridley 3597*a*); Johor, Gunong Pulai (Hullett); Selangor, Dusun Tua, Batu Caves (Ridley 8138); Perak, Larut (King's Coll. 5559), Sungei Raya (King's Coll. 965), Thaiping Hills Cottage (Hervey); Lankawi (Curtis). Distrib. Malaya.

G. Korthalsi Mett. Perak, Larut on trees (King's Coll. 2943), Thaiping Hills Cottage (Hervey); Penang Hill (Fox).

NIPHOBOLUS.

N. adnascens Sw. "Sakat Batu" on rocks and trees. Singapore, Pulau Ubin (Ridley 9510), Changi Beach (4347); Johor, Gunong Pulai (Hullett); Malacca, Pulau Undan (Cantley's Coll.), Ayer Keroh; Dindings, Lumut (Ridley 10145); Perak, Harum Parah (Scortechini 844), Kamuning (Machado); Penang Hill (Ridley).

var. *longifolius*. Perak, Thaiping (King's Coll. 8336). Distrib. Africa, India, Malaya, China, Polynesia.

N. acrostichoides Sw. Common on trees in open country. Singapore, Tanglin, Chan Chu Kang (Ridley 6684); Johor, Batu Pahat (Ridley), Jambu Larang (Fielding); Malacca, Mt. Ophir; Pahang, Kuala Pahang; Perak, Gunong Batu Putih (Wray 1232). Distrib. Burmah.

N. Heteractis Mett. Perak, Kuala Dipang (King's Coll. 8275). Distrib. India.

N. stigmosum Sw. Perak, Gunong Pondok (King's Coll. 8361), Batu Kurau (Scortechini). Distrib. India.

N. penangianus Hook. Pahang, Kota Glanggi (Ridley); Selangor, Kuala Lumpur (Curtis); Perak, Kinta (King's Coll. 7083); Penang, just above the waterfall (Hullett). Distrib. Burmah.

N. hoyaefolium T. Moore. Singapore, Woodlands (Matthew); Johor, Mt. Austin (Ridley).

N. nummulariaefolius Sw. On trees, "Berunas Jantan." Pahang, Kuala Pahang (Ridley); Sungei Ujong, Bukit Sulu (Cantley); Perak, Tambuan near Ipoh (Ridley 9829), Kuala Dipang (King's Coll. 8270). Distrib. India.

DIPTERIS.

D. Horsfieldii Br. On rocks by the sea, and also on mountain tops. Singapore, Harbour, Kranji (Ridley 1673), Pulau Tekong (4227); Johor, Gunong Pulai, Gunong Panti, and by the Scudai River (Ridley); Malacca, Mt. Ophir; Selangor, Pahang route (Machado), Hulu Semangkok (Ridley); Perak (Scortechini); Penang Hill (Hullett, etc.); Kedah Peak (Ridley). Distrib. Malay isles, Polynesia.

D. Lobbiana Hook. On banks of streams. Johor, Gunong Panti (Ridley 4141); Pahang, Tahan River (Ridley 2170); Malacca, Mt. Ophir (Derry); Perak (Scortechini, Wray 2920), Bujong Malacca (Ridley); Kedak Peak Ridley). Distrib. Borneo.

DRYNARIA.

D. splendens Hook. Singapore (fide Beddome).

D. quercifolia L. Common on trees, "Sakat Laipang." The leaves are burnt and applied to the stomach for miscarriage. Singapore, Pulau Ubin (Ridley 9484), Bukit Timah, Tras (1673); Johor, Scudai River (Ridley 12223); Pahang, Tembeling River; Malacca, Bukit Bruang (Cantley); Perak (Scortechini), Batang Padang (King's Coll.); Penang Hill (Ridley). Distrib. Indo-Malaya.

D. Linnaei Bory. Singapore, Changi, Serangoon (Ridley 4352), Tanjong Gol; Pahang, Pulau Datoh, Pulau Chengei (Ridley); Perak, Batang Padang (King's Coll. 8087); Penang, near the Bath (Ridley 7077); Tringanu, Bundi (Rostado). Distrib. India.

D. Heracleum Kze. "Paku Sulo." Johor, Tanjong Kupang (Ridley 4353); Perak, Maxwell's Hill (Scortechini 228), Larut (King's Coll. 6302), Box Hill (Fox).

D. rigidula Sw. On rocks and trees. Selangor, 15th mile Pahang track (Ridley); Perak (Scortechini), Bujong Malacca (Ridley 9552); Penang, Penara Bukit (Ridley 6945); Kedah Peak on Precipices (Ridley 5151). Distrib. Malaya, Australasia.

PLEOPELTIS.

Pl. accedens Bl. Sungei Ujong (Hullett); Selangor, 15th mile Pahang Track (Ridley); Perak, Bujong Malacca (Ridley 9616), Larut (King's Coll. 1900), Kuala Kangsa (Ridley). Distrib. Malaya, Polynesia.

P. Wrayi Bak. Pahang, Kluang Terbang (Barnes); Perak, Gunong Hijau, Cottage and the Tea Gardens, Thaiping Hills (Day, Scortechini, Wray, King 2358, 3673, Ridley, Hervey). Endemic.

P. stenophylla Bl. High up on lofty trees in the low country, on rocks and low trees in the hills. Singapore, Bukit Timah (Ridley 4350); Johor, Gunong Banag, Bukit Pahat (Ridley 1255); Perak, Maxwell's Hill (Scortechini 263); Penang (Cantley); Kedah Peak (Ridley). Distrib. Malaya.

Pl. sinuosa Wall. On trees common in the south, remarkable for the thick hollow rhizomes full of biting ants. Singapore, Gardens, Bukit Timah, Jurong (Ridley 5864); Johor, Gunong Pulai (Hullett); Penang (Curtis 10137). Distrib. Malaya.

Pl. rupestris Bl. Perak at 4000 feet alt. (Scortechini 251, King 7355), Gunong Inas at 5000 feet (Wray 4123).

Pl. longifolia Mett. Singapore, Sungei Morai, Bukit Timah (Ridley); Johor, Tebing Tinggi (Ridley), Gunong Pulai (Hullett); Negri Sembilan, Perhentian Tinggi (Ridley 10820); Perak, Larut (King's Coll. 1904, 2741), Waterloo (Curtis), Bujong Malacca (Ridley 9614). Distrib. Indo-Malaya.

Pl. superficialis Bl. Perak, Larut 3 to 4000 feet (King's Coll. 2180, Scortechini), Maxwell's Hill (Ridley). Distrib. India, China.

Pl. angustata Sw. "Paku Hilan," common on trees. Singapore, Gardens (Ridley 10162), Pulau Ubin (King's Coll. 201); Sungei Morai, Bajau, Changi (a forked form); Johor, Tanjong Bunga, 4th mile from Johor Ridley); Perak, Thaiping Hills (Ridley, Scortechini 1082),Kuala Kangsa (Ridley); Penang, Government Hill, Convalescent Bungalow (Ridley). Distrib. India, Australia.

Pl. platyphylla Sw. On rocks and trees at high elevations, a beautiful species. Selangor, Pahang Track (Ridley 8653) and Semangkok Pass; Perak, Gunong Haram Parah (Scortechini); Kedah, Yan (Ridley 5169).

Pl. membranacea Don. Perak (Scortechini).

Pl. punctata L. *Pl. irioides.* Common on low trees and stumps. Singapore, Chan Chu Kang, Serangoon (Ridley 8935), Sungei Buloh, Gardens, etc; Malacca, Pulau Besar; Selangor, 15th mile Pahang Track (Ridley 8657); Perak, Thaiping (Scortechini 538); Penang (King's Coll. 5069), Pulau Badak (Curtis 3958). Distrib. Tropics of Old World.

P. musaefolium Bl. Selangor, Ginting Bidai, Batu Caves (Ridley); Perak, Sungei Rayah (King's Coll. 862) and Larut 1890). Distrib. Malaya.

P. Scortechinii Bedd. Perak, Maxwell's Hill (Scortechini 2161), Thaiping (King's Coll. 8382). Endemic.

Pl. pteropus Bl. Perak (Scortechini), Kinta River (King's Coll. 386). Distrib. Indo-Malaya, China.

Pl. incurvata Bl. On rocks and trees at high elevations. Selangor, Bukit Hitam; Perak, Bujong Malacca (Ridley), Cottage Thaiping Hills (Hervey); Kedah Peak (Ridley) one form with simple ovate sterile fronds, and simple linear fertile ones. Distrib. Malaya.

Pl. insignis Bl. Malacca (fide Beddome).

Pl. Phymatodes L. "Pulau Wangi," "Sakat Hitam." A very common and variable fern. The sweetly scented fronds have an odour of Coumarin when dry and are used for putting among clothes to scent them by natives. Singapore, Gardens, Passir Panjang, Tampinis River, Changi (Ridley 2681), Pulau Ubin (4360), Bukit Timah 4359); Johor; Pahang, Kuala Pahang (Ridley 1448), Pekan (1581); Malacca, Pengkalan Minyak; and Bukit Panchur (Cantley); Perak, Thaiping (Scortechini 539); Dindings, Lumut (Ridley); Penang, Top of the Hill (Ridley 7005); Lankawi (Curtis). Distrib. All the Tropics of the Old World.

Pl. longissima Bl. Perak, Kinta River (King's Coll. 402). Distrib. Indo-Malaya.

Pl. nigrescens Bl. "Paku Chiai." Singapore, Bukit Timah (Ridley, King's Collector 349); Sungei Ujong, Bukit Sulu (Cantley's Coll.); Selangor, Batu Caves (Ridley); Perak (Scortechini); Tringanu, Bundi (Rostado). Distrib. India.

Pl. laciniata Bl. Perak, Thaiping Hills, Coulfield's Hill (King's Coll. Day).

Pl. palmata Bl. Perak, Gunong Batu Putih (Wray 580), Maxwell's Hill (Scortechini); Penang Hill (Ridley 7154); Prov. Wellesley, Bukit Panchur (Ridley 12639). Distrib. Malay islands.

GRAMMITIDAE.

MONOGRAMME.

M. paradoxa Fee. Penang Hill, rocks at Richmond Pool (Ridley 7135). Distrib. Ceylon, Malaya, Australia.

M. trichoidea Sm. Rocks in forest. Singapore, Bukit Timah (Ridley); Selangor, Pahang track, 15th mile (Ridley). Distrib. Philippines.

M. dareaecarpa Hook. A minute hair-like plant. Singapore Bukit Timah, on rocks at the base of the hill (Matthew). Distrib. Borneo.

STEGNOGRAMME.

S. aspidioides Hook. Perak, Kinta (King's Coll. 7207). Distrib. Indo-Malaya.

GYMNOGRAMME.

G. calomelanos Kaulf. "Paku Merak." Probably introduced but now scattered widely over the whole Peninsula and often far from cultivation. Singapore, Chan Chu Kang, Pulau Ubin, etc. (Ridley); Johor, Tanjong Kupang; Malacca (Hervey); Selangor, Rawang (Ridley 7834), Kuala Lumpur (Goodenough); Penang, Waterfall Hill (Ridley 3064); Tringanu, Bundi (Rostado).

SYNGRAMME.

S. fraxinea Don. Perak, Larut at 2-2300 feet elevation (King's Coll. 2251, Scortechini). Distrib. Africa, Indo-Malaya, Polynesia, Japan.

S. Lobbiana Hook. Johor, Gunong Panti (King 205).

S. Wallichii Hook. Damp places in forests. Singapore, Bukit Timah (Ridley 5869) a variety with branched fronds is not rare, Chua Chu Kang (Ridley 10694); Johor, Tanjong Kupang; Perak, Maxwell's Hill (Ridley); Penang Hill. Distrib. Borneo.

S. alismaefolia Hook. "Paku Tombak." Less common than the last but really hardly distinct. Singapore, Chan Chu Kang; Malacca, Merlimau (Cantley's Coll.), Ayer Keroh (Ridley); Negri Sembilan, Bukit Kayu Arang (Cantley); Perak, Thaiping (Scortechini). Distrib. Mal.

S. Dayii Bedd. Perak Pass between Kuala Kangsa and Kinta at 2000 feet elevation (Day). Endemic.

SELLIGUEA.

S. Feei Hook. On trees low down. Common in mangrove swamps. "Paku Galah Hantu Laut." Singapore, Kranji, etc.; Johor, Gunong Pulai; Malacca, Batu Tiga (Derry); Pahang, Tahan River (Ridley); Perak, Larut (King's Coll 3942), Box Hill (Fox), Bujong Malacca (Ridley); Penang Hill (a branched form). Distrib. Malaya.

S. membranacea Hook. Singapore (Moore's herbarium); Perak, Ulu Kerling (King's Coll. 8844, 948, 2986), Upper Perak (Wray 3638). Distrib. Malaya.

S. Maingayi Baker. Malacca (Beddome). Endemic.

S. campyloneuroides Bak. Perak, Sclama River (King's Coll. 3112), Goping on shrubs (8145). Distrib. Borneo.

LOXOGRAMME.

L. lanceolata Sw. Malacca, Bukit Tampin (Goodenough); Selangor, 15th mile Pahang Track (Ridley 8646); Perak, Kinta (King's Coll. 4754), Larut (2235), Bujong Malacca (Ridley 9615). Distrib. Africa, Indo-Malaya, China, Polynesia.

L. involuta Don. Selangor, 15th mile Pahang Track, Rawang Camphor woods (Ridley 7831); Sungei Ujong (Hullett); Perak, Kuala Dipang (King's Coll. 8280), Kinta (Kunstler 373), Cottage Thaiping Hills (Hervey). Distrib. Indo-Malaya, Polynesia.

L. avenia Bak. Pahang, Tahan River (Ridley's Collector); Selangor, 15th mile Pahang Track (Ridley); Penang Hill (Ridley). Distrib. Malaya.

BRAINEA.

Br. insignis Hook. On the ground near the sea. Dindings, Pulau Sembilan (Curtis and Ridley 3056). Distrib. India, Hongkong.

MENISCIUM.

M. triphyllum Sw. Singapore, Ditches near Macpherson Road (Ridley 9146); Pahang, Tahan River (Ridley); Perak, Upper Perak (Wray 3522). Distrib. Indo-Malaya, China.

M. cuspidatum Bl. Singapore, Bukit Timah, Chan Chu Kang, Upper Mandai (Ridley 4399); Johor (Hullett), Batu Pahat on Bukit Soga (Ridley 10972); Malacca, Sungei Hudang Road (Derry 86); Sungei Ujong, Tampin (Goodenough) Penang, Government Hill (Ridley). Distrib. Indo-Malaya.

M. salicifolium Wall. On rocks. Singapore, Selitar (Bishop Hose); Perak, Relau Tujor (Wray 183), Bujong Malacca (Ridley); Penang, Government Hill (Ridley). Endemic.

M. sp. Perak, Larut Hills (Curtis 3717).

ANTROPHYUM.

I doubt if any of these species are specifically distinct except perhaps the last.

A. reticulatum Kaulf. On rocks. Singapore, Bukit Timah, Selitar (Ridley 4345); Johor, Batu Pahat (Ridley

11069); Pahang, Tahan, Kota Glanggi (Ridley); Malacca, Alor Gajah; Selangor, Gunong Hijau (Goodenough), Labu River, Batu Caves (Ridley); Perak (Scortechini), Bujong Malacca (Ridley); Penang Hill. var. *parvulum* Bl. Perak (Hullett). Distrib. India, Australasia.

A. plantagineum Kaulf. Penang Hill (Ridley). Distrib. Indo-Malaya, Polynesia.

A. semicostatum Bl. Dindings, Lumut (Ridley); Perak, Maxwell's Hill (Scortechini 237). Distrib. Malaya, Polynesia.

A. latifolium Bl. Sungei Ujong (Hullett); Perak (Scortechini). Distrib. Indo-Malaya.

VITTARIA.

V. elongata Sw. Common on trees. Singapore (King's Coll. 223), Thomson Road (Murton), Green Hill (Hullett), Passir Panjang, Sungei Morai, etc. (Ridley); Johor, Pengaram (Ridley); Muar, Sungei Pauh; Malacca, Selandan, Mt. Ophir (Ridley); Pahang, Pekan (Ridley); Selangor, Ginting Bidai; Perak, Bujong Malacca (Ridley). Distrib. Tropics of Old World.

V. lineata Sw. Common on trees. Selangor, Ulu Selangor (Goodenough); Kedah (King's Coll. 1739). Distrib. All Tropics.

V. sulcata Kuhn. On trees at high altitudes. Selangor, Bukit Hitam (Ridley); Malacca, Gunong Mering, Ophir (Ridley 3352); Perak (Scortechini); Kedah Peak (Ridley). Distrib. Ceylon.

V. falcata Kze. Malacca, Gunong Tunduk, Ophir (Ridley 9864); Pahang, Keluang Terbang (Barnes); Selangor, Hulu Semangkok; Perak, Bujong Malacca (Ridley).

V. scolopendrina Presl. Singapore, Kranji, Tanglin, Chua Chu Kang (Ridley 1030); Pahang, Tahan River (Ridley); Perak, Maxwell's Hill (Scortechini), Goping (Bishop Hose), Gunong Batu Putih (Wray 1132);

Kedah (Curtis); Lankawi, Gunong Raya at 2500 feet (Curtis). Crested and branched forms occur in Tanglin and elsewhere in Singapore. Distrib. Africa, Indo-Malaya.

TAENITIS.

T. blechnoides Sw. Common in woods all over the Peninsula, and very variable. "Paku Pijai," "Paku Balu."

var. a. Fronds simple. Malacca, Mt. Ophir (Ridley 3366) and Mering. A branched form occurs on Ophir; Selangor, Pahang Track (Ridley).

var. b. Fronds pinnate narrow. The commonest form. Singapore, Garden jungle, Sungei Morai, Selitar (Ridley 4334); Johor, Gunong Pulai (Ridley); Malacca, St. John's Hill, Pulau Besar (Ridley 4335); Pahang, Tahan River, Kuala Semantan (Ridley); Perak (Scortechini 34); Kedah Peak.

var. c. Fronds pinnate very broad. Singapore, Bukit Timah, Tras (Ridley 8568) and Changi (2683). Distrib. India, Malaya.

DRYMOGLOSSUM.

D. piloselloides Presl. Extremely common on trees, and very troublesome, covering the branches "Sakat Ribu-Ribu." A curious crested form on the trees of the Cathedral close (Bishop Hose). Singapore, everywhere Bukit Mandai (Ridley 6032), Teban (4346), Pulau Ubin, Tanglin, etc.; Johor, common; Malacca, Ayer Panas; Perak, Thaiping (Scortechini), Kamuning (Machado); Tringanu, Bundi (Rostado). Distrib. Indo-Malaya.

HEMIONITES.

H. arifolia Burn. In limestone districts usually on the rocks. Perak, Kamuning on the ground (Ridley), Larut (King's Coll. 4174); Lankawi (Curtis). Distrib. Indo-Malaya.

H. sp. Selangor, Gua Batu (Ridley 8135).

ACROSTICHEAE.

ELAPHOGLOSSUM.

Most of the local species much resemble each other, and are rather difficult to separate. The species are not so rare as might appear but seldom fruit.

E. laurifolium Bedd. *E. latifolium* Bedd. Singapore, Kranji (mangrove swamps); Pahang, Tahan River (Ridley), Kluang Terbang (Barnes); Perak, Top of Gunong Batu Putih (Wray 319); Kedah, Gunong Jerai (Ridley 5168).

E. conforme Sw. Pahang, Tahan River (Ridley); Penang Hill (W. Fox).

E. Norrisii Hook. Malacca, Mt. Ophir (Ridley 3334, 9870); Penang (Ridley); Perak (King's Coll. 2222). Endemic.

STENOCHLAENA.

S. palustre L. One of the commonest ferns, "Paku Ramu," "P. Mesin, or P. Miding or Lamiding." The young leaves very popular as a vegetable. Singapore, Tanglin, Balestier Road (Ridley 6249); Johor, Tanjong Kupang (Ridley 4234) and Kota Tinggi; Malacca (Hervey), Pulau Undan (Cantley's Coll.); Perak, Goping (King's Coll. 834), Waterfall Thaiping (Wray, Scortechini 469); Tringanu, Bundi (Rostado). Distrib. India, China, Polynesia.

S. sorbifolia L. Common in forests. The variation in the form of the fronds is very remarkable. Singapore, Bukit Timah; Johor, Gunong Pulai (Hullett); Pahang, Tahan River (Ridley); Selangor, Semangkok Pass, Ulu Langat, Batu Caves (Ridley); Perak (Scortechini), Larut (King's Colo. 4205), Upper Perak (Wray 3703), Waterfall Hill, Maxwell's Hill, etc. Distrib. All tropics.

S. perakense Bedd. Perak, Thaiping (King's Coll. 8345). Endemic.

POLYBOTRYA.

P. appendiculata Willd. On rocks in forest. Singapore, Bukit Timah (King's Coll. 335) and all other collectors, abundant. Dindings, Lumut (Ridley); Perak (Scortechini); Lankawi (Curtis).
var. *subintegra* Bedd. Johor, Batu Pahat (Ridley). Distrib. Indo-Malaya, China.

STENOSEMIA.

S. aurita (Sw.) Limestone Rocks. Pahang, Kota Glanggi (Ridley); Selangor, Batu Caves (Ridley); Perak, Kwala Dipang (Ridley 9547), Goping (King's Collector 442). Distrib. Malay islands to the Solomon isles.

S. sp. Penang Hill (Ridley 7078).

GYMNOPTERIS.

G. variabilis Hook. Perak, Kinta (Scortechini 7107).
var. *axillaris*. Perak, Ulu Bubong (King's Coll. 10028). Distrib. India.

G. spicata Linn. fil. Not very common. Pulau Tioman (Ridley); Perak, Maxwell's Hill, Cottage Thaiping Hills (Ridley, King's Collection 6373); Penang Hill rocks on the top (Ridley, King's Coll. 1597); Kedah. Distrib. India.

G. flagellifera Wall. In muddy spots by streams. Singapore, Stagmount (Ridley), Pulau Tioman; Selangor, Rawang; Perak (Scortechini), Goping (King's Collection 1097). Distrib. India.

G. subrepanda Hook. Singapore, Bukit Timah (Ridley); Perak, Chanderiang (King's Collection 5797), Upper Perak (Wray 3379), Thaiping Hills Cottage (Ridley). Endemic.

G. Presliana Hook. In dense forests. Singapore, Bukit Timah (Hullett, Ridley, etc.). Distrib. Concan and Philippines.

G. contaminans Wall. Perak (Scortechini).

G. costatum Wall. Penang, Balik Pulau (Curtis). Distrib. India and Burmah.

LOMAGRAMMA.

L. perakensis Bedd. Perak at 400 feet elevation (Day, King's Collector 8345). Endemic.

ACROSTICHUM.

A. aureum L. Common in tidal rivers, but sometimes long persisting after the river has disappeared. I have seen it thus in open places far inland as at the base of Gunong Pantai (Johor), Bukit Asahan (Malacca) and in the Botanic Gardens in Singapore. It is abundant in Singapore even in the town canals; Johor, Batu Pahat, etc.; Dindings at Lumut; Selangor, Klang, etc.; Perak; Kedah; Penang. Distrib. All tropics.

PHOTINOPTERIS.

Ph. rigida Wall. On boughs of trees overhanging rivers and mangrove swamps. Singapore, Kranji, Woodlands (Matthew); Johor; Perak, Goping (King's Coll. 861); Penang (Curtis). Distrib. Malaya.

P. drynarioides Hook. Rare. Penang Hill (Bishop Hose). Distrib. Malay isles.

CHRYSODIUM.

Ch. bicuspe Hook. In mossy spots by streams at 3000 feet elevation. Malacca, Mount Ophir on the banks of the stream above Padang Batu (Ridley 9872); Perak, Thaiping Hills (Ridley). Distrib. Java and Formosa.

PLATYCERIUM.

Pl. grande Sm. Singapore (fide Beddome, but no one else seems to have seen it here); Lankawi islands, Curtis found one or two plants there. Distrib. Malaya, Australia.

Pl. biforme Bl. The common elk's horn fern, abundant every where and attaining a very large size. Singapore, Tanglin, Selitar (Ridley 3595), Bukit Timah (Ridley 4354, 8049). All over the peninsula. Distrib. Indo-Malaya.

var. *erecta.* A much smaller plant with the fertile fronds erect and short. Sterile ascending fronds a foot long and as wide, very strongly ribbed, rounded in outline, and dotted over with hairs arranged stellately, fertile fronds stiffly erect 8 to 18 inches long, 8 inches across, dichotomously branched, the tips of the branches rounded, fertile lobe spathulate or obovate pedicelled 2-5 inches long and as wide in the widest part. Singapore, Bukit Timah on very lofty branches of trees (Ridley 10830). Bishop Hose first pointed out this plant to me some years ago on perfectly inaccessible boughs of a lofty *Shorea* tree 100 feet or more from the ground. There are a number of plants on the boughs, all are quite similar and there are no typical specimens of *Platycerium biforme* on the tree though it is abbundant in the surrounding forests. I have only been able to obtain fallen fronds. Mr. C. J. Matthew took specimens to Kew and Mr. Wright notes on them as follows. "I do not think this can be separated as a distinct species from *Platycerium biforme* Bl. but is a form produced by growing in exposed situations and is worthy of a varetal name. It has also been collected in Borneo by Motley who remarks " on the highest branches of trees in very exposed places perhaps only [a form] of the long drooping plant growing in damp and shade." The plant is certainly most closely allied to *P. biforme* Bl., but I hardly think it can be classed as merely a form or state of that plant. I have seen the ordinary form growing in quite exposed places, on lofty trees and showing no variation. The variety with its short stiff erect fronds, has a most curious appearance, and really looks more distinct from the typical form than any other *Platycerium* I have seen. I note however that in *P. biforme* the young branched fronds when first protruded point directly upwards and then first spread out horizontally, then deflex. On the same trees which bear this curious fern, grows also *Lecanopteris carnosa* the only lowland locality I know for this plant.

SCHIZEACEAE.

SCHIZAEA.

S. malaccana Bak. Mossy places at 4000 feet elevation. Malacca, Mt. Ophir (Ridley 9860); Kedah Peak (Ridley). Distrib. Malay isles.

S. dichotoma Sw. Common in dry woods or sandy spots, whole peninsula, "Paku Tumbar," "Paku Jarum." Singapore, Toas, Passir Panjang, Kranji, etc. (Ridley); Johor, Pengaram, Gunong Pulai (Ridley); Pahang, Kwantan (Craddock), Rumpin River, Pekan (Ridley); Malacca, Brisu and Sungei Hudang (R. Derry); Perak, Ulu Kul (King's Coll. 10759). Distrib. nearly all the tropics.

S. digitata Sw. Common in woods. Singapore, Garden Jungle, Reservoir Woods, etc. (Ridley); Johor, Tana Runto (Ridley); Pahang, Kuala Tembeling; Malacca, Pengkalan Ampat, Selandau (Ridley); Negri Sembilan, Kuala Pedas; Selangor, Batu Caves on the top of the rocks; Perak (Scortechini), Thaiping Hills, Tea Gardens (Ridley), Waterfall Hill (Wray); Penang Hill; Kedah Peak. Distrib. Indo-Malaya, Polynesia.

LYGODIUM.

L. circinatum Sw. *L. dichotomum* Bedd. One of the commonest and best known ferns, "Ribu-Ribu Dudok," or "Bukit," "Paku Jari Merah" (Tringanu). Leaves used for headache. Singapore, Tanglin, Bajau, Chan Chu Kang (Ridley 4229, 8057), etc.; Malacca, Sungei Udang, Chabau (Ridley 9871); Pahang, Tahan River;

Perak, Waterfall Hill (Wray 2324), Larut (King's Coll. 7503); Tringanu, Bundi (Rostado); Lankawi (Curtis). Distrib. Indo-Malaya, China.

L. microphyllum Br. Not rare in open grassy places. Singapore, Kranji, Botanic Gardens (Ridley 6917); Johor, Kampong Bahru, Tebing Tinggi (Ridley); Perak (Scortechini). Distrib. Indo-Malaya.

L. flexuosum Sw. Common in the low country, "Akar Sidin," "Ribu-Ribu Gajah." Singapore, Botanic Gardens; Pahang, Kuala Tembeling (Ridley); Malacca, Pengkalan Minyak, Gunong Berumbun (Cantley's Coll.); Penang Hill, Telok Bahang (Curtis 625); Tringanu, Bundi (Rostado); Kedah Peak (Ridley); Kelantan, Kuala Lebir (Dr. Gimlette).

var. *alta* Clarke. Perak (King's Coll. 2975). Distrib. Indo-Malaya, Africa, Australia.

L. polystachyum Wall. Pahang, Kuala Tembeling (Ridley 2156); Perak, Upper Perak (Wray); Penang, Waterfall (Hullett). Distrib. Burmah.

MARATTIACEAE.

ANGIOPTERIS.

A. evecta Hoffm. Not rare in woods, commonly known locally as the elephant fern. Singapore, Bukit Timah (Hullett, etc.); Pahang, Pekan (Ridley); Perak, Maxwell's Hill (Scortechini 219, King's Coll. 5203). Distrib. Indo-Malaya, Australia, Madagascar.

KAULFUSSIA.

K. aesculifolia Bl. Terrestrial in damp spots or on rocks. Selangor, Batu Caves covering the ground in great masses, in damp spots (Ridley 8640); Perak, Thaiping Hills (Curtis 3718, Ridley, Scortechini) on rocks or the ground, Kinta (King's Coll. 4784). Distrib. Indo-Malaya.

OPHIOGLOSSACEAE.

OPHIOGLOSSUM.

O. reticulatum L. Penang in dry spots in the waterfall valley (Ridley 9837, 11394). Distrib. Eastern Tropics.

O. nudicaule L. fil. In grassy spots. Singapore, Bukit Panjang (Ridley 4205), Chan Chu Kang (Ridley 2421). Distrib. Tropics.

O. pendulum L. Singapore, Tanglin, Bukit Mandai, etc. (Ridley); Selangor, Rawang, Camphor Woods (Ridley); Perak, Gunong Batu Putih (Wray 1133). This plant usually grows on *Platycerium* but also on trees. It has a habit of suddenly appearing and spreading widely and then apparently disappearing. At one time the only locality I knew for it was on a tree in the Barracks Grounds. This died and the plant disappeared there, but then appeared in the Botanic Gardens, and spread rapidly. Distrib. Eastern Tropics.

HELMINTHOSTACHYS.

H. zeylanica L. In damp muddy spots in open country in thickets. Malacca, Brisu (Derry); Pahang, common along the Pahang River, Pekan, Pulau Manis, Pulau Jellam, Kuala Tembeling; Selangor, near the Batu Caves (Ridley 8152); Perak (Scortechini), Blanja (Wray 140); Tringanu, Ismail Rantau (Down). Distrib. Eastern Tropics.

ADDENDUM.

Alsophila glabra Hook. Bukit Timah and other forests in Singapore in damp spots. This is the plant mentioned as *Amplicosmia alterans* from Singapore. It is named by Mr. Matthew.

Some Visits to Batam Island.

C. Boden Kloss, F.Z.S.

Pulo Batam though so close to Singapore and frequently visited by pig-shooters, has never been investigated by a naturalist, so perhaps the following extracts from journals—though of trivial happenings as must necessarily be the case where the fauna of small islands is concerned—kept during two short visits I paid to it to collect animals may be of interest.

This island is 9 miles distant from Singapore, about 15 miles long and 10 miles broad. The northern side is indented and elsewhere it is closely surrounded by other islands. There are hills in the interior covered with jungle, where large outcrops of quartz occur and the boulders are a quartz grit. Much of the low land which has at one time been cleared is swampy or sandy and very poor but where red laterite soil occurs pineapples flourish under the cultivation of Chinese and Bugis settlers. Many young getah trees (*Dichopsis* sp.) are found in the forests where roam a tribe of Proto-Malays still little affected by outside influences.

My first visit was paid in September 1905. I left Singapore in a 10-ton cutter-yacht at 11 a.m., got caught in a squall off Pulo Sambu in the afternoon, ran on to a sand-bank at low tide later on but poled off, and anchored off a kampong at the head of Senimba Bay at 5.30 p.m. The upper part of the bay is very shoal and at low water wide mud-flats are exposed all round. I collected some interesting small sponges of bright colours on them. There were seven houses in the kampong and others building further along the shore.

After getting the baggage landed next morning we found a deserted Chinese shop behind the village. This we broke open and throwing all the rubbish it contained into a side compartment, I set up my bed, table and chair in the centre room while the boy fixed up his kitchen and sleeping place in a third. There was a hole of good drinking water at hand and a bathing well a little farther off so we felt very comfortable.

A row of wooded hills ran south-easterly towards the centre of the island, a river debouched at the head of the bay and across the water a couple of miles away were the slopes of a long peninsula.

As I sat talking to the natives in the doorway of my house in the afternoon we saw the eyes of a large crocodile above the calm water about 140 yards away and I was asked to shoot it but refused since my gun was only sighted to 100 yards. However, being pressed, I took a very full sight and fired from my chair; there was a furious turmoil and the reptile disappeared. The natives said it was hit, and indeed three or four days later we found it in the mangroves with its brains flicked out—a 13-footer. When afterwards invited to repeat the performance I was not to be tempted—it was a case of letting well alone.

At 3 p.m. I went out with a parang and found a path going up the hills; cleared it and set 3 dozen traps. Coming back found a pair of "tupai tanah" (*Tupaia ferruginea batamana* sp. nov.) just caught and saw several small pigs. Skinned tupaia and after dinner went along the shore for pig but saw none.

"16th. Set off at 5.30 a.m. to examine the traps which contained a number of rats (*Mus lingensis*) and some tupaia, all much ant-eaten. Found this hill jungle practically lifeless as the forest was poor being without fruit trees, but got a species of civet cat (*Arctogalidia simplex*) which was a valuable prize, and a horn-bill—the "burong klinking" (*Anthracoceros convexus*). Skinned till 5.30 and then reset traps. Lent the gun in the evening to a man who wanted to try for pigs in his plantation.

"17th. No pig seen by the natives. Very little in traps so brought some away and set them lower down amongst coconuts. Got a pair of horn-bills and some squirrels (*Sciurus vittatus*) with the .410 gun amongst the palms; both these are numerous near the village and horn-bill steak is very good. Some men went to set "jerats" for napu and borrowed the gun in order to try for lotong and krawar (*Ratufa* sp.) and coming down myself from setting traps without it I saw a large bearded pig!

"18th. Some fresh rats from the coconuts: one appears to be *Mus jarak* and the other rather like *Mus griseiventer* of Johor. Went to the Bugis plantations inland to the S. W. of the range. They are on poor flat land and consist of pines, bananas and tapioca: the forest beyond, which was swampy and largely composed of Melaleuca trees, was quite empty. The napu-trappers had no luck.

"19th. A couple of small concolorous rats from the coconuts. Away to another patch of jungle beyond the gardens but was disappointed as it was merely a small clump with swamp on the far side. A boy brought some "tikus padi" caught in his house. In afternoon went along foot of hills after pig: saw monkeys only but couldn't get near as they went to ground at once, which makes me think they were "berohs." 25 skins to date.

"20th. Set off for the distant jungle beyond the hills and almost immediately got a "klabu" in the mangroves near the house—a female *cristata,* weight 11 lbs. Had much trouble getting through secondary growth and "resam" fern but finally entered the forest and found a path running along a deep gully where a *Didymocarpus* with violet flowers was growing amongst the rocks. Saw a few common birds but no animals, except another lotong which I got. Found a better way home where two napus were awaiting me, both very large and bright with clear orange necks. Set traps and waited again for pig.

"21st. Heavy rain all morning so stopped in and skinned the napus. Went out later along the ridge of the hills but got nothing. The view of land and water, north and west was very fine but could see very little jungle in the interior.

"22nd. Off to the far jungle where I saw absolutely nothing but think I heard the cry of a *Ratufa*. The few traps out had been interfered with by a pig. 39 animal skins.

"23rd. Hired a large leaky boat and paddled and sailed to Pulo Sambu where we found a launch going to Singapore which gave us a lift: arrived home 9 p.m."

My second visit to Batam was the outcome of a desire to collect on Bulang Peak. I left Singapore on March 18th 1906. I had a Malay prau on this occasion which didn't sail anything like as well as the cutter and we had to do a lot of rowing, particularly amongst the tide-rips behind Pulo Sambu. However we got to Pulo Boyan, where the Controleur is stationed, at seven o'clock and anchored in the strong tide of the Batu Hadji Straits for the night.

I found that the Controleur, who was newly appointed, could give me no information about Bulang but he courteously offered me the services of a constable for the trip which I refused as a useless encumbrance. There was a strong tide against us and no wind all the morning so we passed the time in filling our water-jars from a well on Bulang, as there is no water on the small island, and in the afternoon when the tide slackened we made sail again, reaching at night-fall the kampong where I had hoped to put up. It was in ruins and had evidently been deserted for a long time but I was less disappointed, in that next morning when I made a trip to the Peak I found the way thither to be through swamps while the hill itself had been cleared except on the top, and there was no sign of animal life anywhere. So we sailed back again looking for a place to stop at, but both sides of the strait had been long cleared and were no use for collecting and as I was not provided with any sort of material to form a shelter I decided to put in at Telok Senimba once more—as I was particularly anxious to shoot the bearded pig—and see if I could not add to my former list of specimens, though the locality was not a good one as there was so much cleared land and swamps while the accessible jungle was on hill sides and exceedingly poor. There are no doubt more satisfactory places in the interior but thither one would have to go prepared to camp out.

After leaving the sheltered strait we had a lively time against a strong head wind: the prau, with peak dropped, wouldn't tack in the rough weather and we had to wear every time but when we got into Senimba Bay it was a nice reach down to the kampong. It was low tide and there was a pig on the mud as we arrived so I paddled off towards him with the gun but lost his track in the mangroves. I had been at the tiller for eight hours without a spell and was painfully sun-burnt.

My old dwelling place had been pulled down but another Chinaman had built another unsuccessful shop so we appropriated the empty place as before; and then I had a most glorious bath, hitherto having to be content with a dip in the sea of nights which was a great discomfort but this occasion squared it all.

"22nd. Went along the range at day-break but saw only "krahs": cut a path down the far side along the bed of a dry ravine in hopes of finding jungle beyond but there were only stretches of dense scrub. Spent the afternoon on the mud collecting stone-corals and sponges, small kinds of every possible shape and colour. The kampong women catch shell fish in a rather ingenious manner: they search the exposed mud for the hole in which the mollusc lives and then push down a stout piece of the midrib of a rattan palm about twenty inches long and armed at the end with a pair of reversed thorns, and the bivalve lying open at the bottom of the hole closes on the thorns when touched and is drawn up. Got my traps out towards evening and then watched for pig, with no success.

"23rd. Found a *Mus firmus* in the traps; this was not in the last collection. A blank morning on the hill except for a specimen of the beautiful rose-breasted pigeon (*Ptilopus jambu*). Tried a small island across the mud flats where pig were reported but saw none: the mud was fearful stuff to travel through.

"24th. An absolutely blank morning in the jungle but two napus were brought in and gave something to do. Full moon is said by all hands to be the best time for catching mouse-deer. Lent a gun to a would-be shooter who as usual swore to whole rafts of pigs which never seem to materialise.

Found that the new lantern I intended to do night shooting with had no wick so made some out of a piece of towel and went for a long walk with it on my belt after dinner: no result except that I was nearly choked by the smell of burning paint.

"25th. A futile morning in the forest: found a collection of old shelters, Malay *pondok* type, probably made by the "orang utan" of Batam. Half a dozen rats, but all badly damaged by ants. Sat out all the evening in a deserted garden and just before dark a medium-sized "nang-oi" trotted up. Fired at 60-70 yards and found immediately—not for the first time—I had forgotten to put the rifle lever over. Pig cleared away into lallang warmed up by slugs: nothing else put in an appearance except mosquitoes. My gun-borrowing friend said with truth pigs were to be seen in the clearings if watched for long enough!

"26th. Nothing in the traps and only monkeys in the jungle. Set some large traps for musang and afterwards watched for pig. Went for a walk with bulls-eye after dinner but saw nothing.

"27th. Only two specimens in the traps: had to shoot squirrels to make work. The pig-shooter returned his gun; says he has sat up for three nights without seeing anything. A large trap caught a tortoise (*Cyclemys platynota*) later in the day. No luck with the pigs again. Found a large centipede in my mosquito net which should evidently have been taken as a sign that the bed was not safe as in the night a coconut crashed through the roof and landed on my pillow (Memo. always to strip coco-palms before dwelling beneath them).

"28th. The usual frost in the jungle. A young napu was brought in and another tortoise got into the traps; evidently these reptiles are attracted of the putrid meat which forms the bait. A pig had also been caught but he successfully pulled out."

This sort of thing went on for several days during which I got nothing but monkeys, rats, squirrels and tupaia. Traces of pigs were everywhere, huge tracks some of them, and I twice stampeded the animals in dense vegetation but I was never able to catch sight of them and the spring-guns I set were never effective. However I got a new rat in some beach forest, a very beautiful specimen of the *jerdoni* type which made me feel glad I had come to the island again.

One afternoon I went up the river which after some distance turned completely on itself and ran south. It was entirely mangrove bordered, though once or twice there were glimpses of old clearings. A number of small side streams were probably only drainage of the swamp. We landed on an isolated hill where were paths and found some old "jerats" for mouse-deer. The jungle trees were nearly all of a bark-shedding kind but I saw a quantity of the red stemmed palm (*Cyrtostachys* sp.) and collected some orchids—*Grammatophyllums* being plentiful on the mangroves.

As I appeared to have exhausted the district after having made 49 mammal skins, many of the species reported apparently not occuring there, on April 3rd we loaded the prau and rowed down the bay to its head where we got a slight breeze. Outside a strong ebb set us to the eastward but as we neared Singapore Island we met the flood which carried us into the harbour in time to get everything home before night.

I obtained thirteen species of mammals during the two visits and observed two others, while nine more were reported to exist. Thus Batam is by no means exhausted: for if they really occur, the determination of the reported *Presbytes, M. nemestrina, Paradoxurus, Sciuropterus* and *Ratufa* will be interesting, but to obtain this it would probably be necessary to camp in the middle of the island where good jungle may still exist.

MAMMALS OF BATAM.

1. *Presbytes cristata* (Raffles) is fairly common in small herbs both in forest and mangroves. It is known to the natives by the name of "Klabu."
2. *Presbytes species.* A "Kaka" with a white breast was reported to occur. If this is a fact I am inclined to

think it will be the *P. cana,* Miller, of Pulo Kundur and E. Sumatra rather than *P. rhionis,* Miller, of Bintang Island. These are local forms of *P. femoralis* which, though found in the Peninsula and Sumatra, does not occur on the islands of the Rio-Lingga Archipelago.

3. *Macaca nemestrina,* Linn. The "beroh" was said to occur but has not yet been taken in the Archipelago.
4. *M. fascicularis,* (Raffles). The "krah" is common everywhere.
5. *Cynopterus montanoi,* Robin. Bats, apparently of this species, were fairly common and were the only kind I obtained. Malay nama "klawar."
6. *Galeopithecus volans,* Linn. The "kubong" was said to occur.
7. *Tupaia ferruginea batamana,* Lyon. This new subspecies of the "tupai tanah" was exceedingly common. Externally it only differs from *T. ferruginea,* Raffles, in its slightly greyer tail. It is easily separated however by its longer and wider skull.
8. *Arctogalidia simplex,* Miller. This is the Archipelago form. A specimen, the third known, was shot early one morning while it was running along the branch of a high tree. As the people called it a "musang" which they said was common I presume that
9. *Paradoxurus hermaphroditus,* Pallus, or an allied form occurs.
10. *Mus concolor,* Blyth was taken in the Kampongs where it was not uncommon.
11. *Mus firmus,* Miller, is the Sumatran form of the Peninsula *M. validus,* Miller. I have never taken these except on the banks of fresh water streams.
12. *Mus lingensis,* Miller. The Sumatran form of *Mus surifer,* Miller. A dry jungle rat and exceedingly common. It seems to begin feeding at early twilight

as traps specimens are always more damaged by ants than any other kind.

13. *Mus sp.* near *rattus.* The rats provisionally grouped under this heading are most perplexing. They fall readily into two groups which handle in the flesh as extremely distinct. The one division, almost black above with whitish bellies, are finely built animals with very pointed noses and closely resemble *M. jarak,* Bonhote, from Johore. The others with greyish bellies and backs rather like *M. norvegicus* are coarsely built and muzzled and somewhat approximate to *M. griseventer,* Bonh., of Johore. All these were taken in swampy ground near the sea as was *Mus jarak* which I found only amongst mangroves. *Mus griseiventer* however is a Kampong rat.

14. *Mus batamanus,* Lyon. This new species is of the *jerdoni* type. It is a very beautiful shaped rat and the only specimen I obtained was captured in damp littoral forest. Swampy ground seems the habitat of all this group.

15. *Mus musculus,* Linn. Some specimens of the "tikus padi" were brought me by a Bugis boy who had captured them in his house.

16. *Sciuropterus,* sp. Reported; possibly the *amœnus,* Miller of Kundur Island.

17. *Petaurista,* sp. The "kubin" was said to occur.

18. *Ratufa,* sp. Reported. A yellow type, probably near *R. insignis,* Miller, of Pulo Sugi.

19. *Sciurus vittatus,* Raffles. Exceedingly common in the coco-nuts where it was very destructive. Cannot be distinguished in any way from Sumatran and Peninsula forms.

20. *Sciurus tenuis.* Raffles. Reported as very rare. I only know of one specimen from the Archipelago, taken on Lingga Island.

21. *Sus rhionis,* Miller. Observed. This is the "babi bakau" of the natives and is common everywhere. It is the island form of *S. vittatus.*

22. *Sus oi,* Miller. Observed. The "nang-oi" is plentiful but to a solitary collector pigs are difficult to obtain. Generally one is only aware of their presence by a rush through the undergrowth and distant snorts and unless one is lucky in meeting them in the open they rarely figure in collections. The "nang-oi" does great damage to the pineapple plantations and is said to be far less timid than other pigs: in fact the natives reported that boars often merely grunted when they tried to scare them away. They are afraid to shoot it with their ineffective ammunition as it charges when wounded. It ranges from Batam to Banka and throughout the swamp of E. Sumatra.

23. *Tragulus kanchil,* sp. A "pelandoc" is said to occur.

24. *Tragulus javanicus perflavus,* Miller. This new species is a strongly marked form having very bright pelage and a pure orange neck entirely free from black shading. I have it also from Pulo Galang and it has been taken since on Bulang. It affords a particularly good illustration of local variation as *T. formosus,* Miller of Bintang Island, only five miles away, is exceedingly dark with a collar strongly washed with black.

Thus the mammal fauna of Batam is Sumatran and not Peninsular for the above definitely identified species *Mus concolor* and *Cynopterus montanoi* alone are from the Peninsula only. On the other hand, *Mus lingensis, M. firmus* and *Sus oi* are known from the Sumatra and the Rio-Lingga Archipelago only. *Arctogalidia simplex, Sus rhionis* and *Tragulus perflavus* are found elsewhere only in the Archipelago while *Tupaia ferruginea balamana* and *Mus batamanus* are so far known from Batam alone.

I am inclined to think that Batam, Bulang, Rempang and Galang form a small group which faunistically is more nearly related to the islands to the westward than to Bintang on the east, though Pulo Sauh forms a stepping stone to the latter which is only five miles away. Bintang, however, when it is fully investigated will prove to be by far the most interesting island of the whole archipelago. A bank of less than 20 fathoms connects all these islands with both Sumatra and the Peninsula, but the 10 fathom contour lines break them up into various groups of which that above noted is one of the largest.

I have no notes of value about birds for they were scarce and of common species and I soon left off shooting them.

Small collections of reptiles and insects were made but they contained nothing remarkable.

I preserved a few plants during my visits and two of them, which were new, have lately been described by Mr. H. N. Ridley, viz:—*Neckia Klossii* and *Didymocarpus battamensis*.[1] The latter is interesting since it grows at sea-level while I believe that the habitat of the *Didymocarpi*, in this locality at least, is at some altitude.

A few notes on the inhabitants of Batam are given elsewhere in this Journal.

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[1] J. S. B. R. A. S. No. 49.

Some Ethnological Notes.

C. Boden Kloss, F.R.A.I.

In the Journal of the Royal Anthropological Institute Vol. XXXVII., Mr. F. W. Knocker in the course of some notes on the aborigines of Sungei Ujong—the Orang Belanas —relates that they tell in respect of the Sakais, how "the parents plant a parang in the fore-arm of the young, both male and female, projecting a few inches beyond the elbow. The flesh grows round it and it eventually become part of the fore-limb. In after life this limb weapon is used to clear the jungle and not for hostile purposes."

I am able to go one better than this. When living in Johore, it was my practice when travelling in the jungle to endeavour to ascertain whether there were current any traditions of the existence of the orang utan (*Simia satyrus*) in that part of the peninsula. The native name for this great ape is "mawas." In the swampy country south of Gunong Pulai I found that the name was known and the people of the locality told me tales of its possessor. The information was interesting but not quite what I then wanted. The *Orang Mawas* were a kind of devil-men who lived in the swamps where their foot-prints might sometimes be seen. Their feet were turned backwards and, with sharp parangs which grew from their elbows like spurs, they killed any human beings they met and afterwards devoured the bodies.

Nothing discouraged I continued my enquiries elsewhere and learned that the Jakuns of the Endau Sembrong were also acquainted with a strange beast that seemed to be of the kind I was after. This was a huge red hairy man who lived in the trees and was called *tuhu*. I felt I was on the right track at last, but unfortunately the story went on to the effect that the *tuhu* spoke Chinese to a Chinaman when it met him in the jungle, Malay to a Malay, and the Jakun dialect to a Jakun!

The head-men of the Belanas are given as 1, Batin; 2, Jinang; 3, Jukrah—the usual titles among the southern inland tribes. I find that a variant of the latter also occurs among the Proto-Malays of the Kallang estuary in Singapore, a fact which Messrs. Skeat and Ridley failed to elect during their short visit thither (J. S. B. R. A. S. No. 33).

These enquirers state that the head-men of the Kampong they visited were 1, Jinang; 2, Batin. I further find in the neighbourhood one Kampong administered by 1, Batin; 2, Dukrah: and another under 1, Penghulu; 2, Jinang. At Telok Senimba , Pulo Batam, a dozen miles away, the people who are a branch of the "Orang Sabimba" referred to by Logan (Journal of the India Archipelago Vol. I.) have 1, Penghulu; 2, Batin.

The communities of the Kallang River have evidently been drawn from various sources and some guidance may be afforded by these titles as to their derivation.

Amongst these primitive tribes the title of Batin extends throughout their range from the farthest north of Biliton, and in the islands appears to be the only one except where they have come under the influence of the ruling Malays, in which cases a Malay has often been appointed as Penghulu.

In the Peninsula however there are amongst themselves officials subordinate to the Batin known as Jinang and Jukrah. Where (according to Logan and others) a Malay has been appointed to supervise them he also is called, possibly because of his functions, Jinang, and it is needless to say that in these cases the title would occasionally become the superior one. This might account for the reversed "Table of Precedency" noted by Messrs. Ridley and Skeat, as Kampong Roko is a small village hedged in by dominant Malays. The anomaly of Penghulu and Jinang noticed by myself in another Kampong I can only account for by supposing that long ago the title of Batin dropped out of use.

The word *bidoh,* boat (also the name of a stream in Singapore) given as a Non-Malay expression, is in common use amongst the Malays of the west coast of Borneo.

Messrs. Skeat and Ridley suggest that "the Sea-gypsies of Singapore owe their origin largely from "Sakai" hill-tribes of the Rio-Lingga Archipelago" and class the Belandas as "Sakai" also: surely this is a slip and should be Jakun or Proto-Malayan or some other equivalent of these!

It is regrettable that all those English writers who have dealt so interestingly with the primitive people should be restricted in experience to the Peninsula for the Jakuns are only the mainland representatives—and probably least pure—of that large family that is spread throughout a great part of Eastern Sumatra and the islands adjacent. Such, for instance, are the *Orang Akit* of Bengkalis and Rupat Islands, the *Palong* of the upper tributaries of the Siak River, the *Mantong* and many others of the Rio-Lingga Archipelago, the *Orang Gunong* of Banka and the *Sika* of Biliton. The *Kubus* and *Lubus* of the interior of Sumatra also appear to be members of the same family.

To Journal 41 of the Society Dr. W. L. Abbott contributes a note on "Human Images among the Orang Manlong."

According to an old inhabitant of a Kampong at Tanjong Ru, an Oorang Laut by descent—though he would never admit himself to be other than a pure Orang Malayu—these images are called "Tukar Ganti" and, in common with the "Kapal Hantu" and "Rumah Sakit," are constructed, to his knowledge, by all the inhabitants of the Rhio Archipelago and of the creeks round Singapore in times of sickness. When the Tukar Ganti is completed the "penyakit" (sickness) is induced to enter it and it is then taken away to the jungle or some distant spot and there left. Further, all these objects—and this was unknown to me and perhaps is so to others—are used for prophylaxis as well as cure. A current instance was related.

"Ten days ago the village *pawang* came to the people, 'I see the evil spirits,' said he, 'the *hantus* are gathering thickly to afflict the Kampong. Now if we want to escape their machinations every house must contribute 40 cents so that a large vessel may be built into which the *hantus* will enter and can then be sent away to sea.' On the day it is sent off the pawang's house will be under a *pantang* (tabu) to Europeans and all strangers."

My acquaintance also said that once these objects pass from the charge of their makers their superstitious attributes end and no one who takes possession of them is affected in any way. He observed that Europeans called his people idiots for practising such ceremonies. "But," I asked, "what does the Imam say?" "Oh he laughs at us or is angry and says that we are idiots too, for such *hantus* don't exist and such practices are not compatible with Islamism. But our pawang tells us otherwise and as it is a thing we have always done we shall continue to do so."

Mention has been made of the Orang Senimba (Sabimba). They are the people of whom Logan (Jour. Ind. Arch. Vol. I. p. 295) records that a portion were transferred from Batam Island to Johore and settled on the Tebrau River. In Johore all trace of them as a distinct tribe has now disappeared and the names seems forgotten also. Such also I found to be the case with the Biduanda Kallang settled once on the Pulai River. Nevertheless, all the creeks of the Old Straits and of the Johore River estuary are occupied by people who, although now Islamised, are still primitive in habits and appearance and quite distinct from the dominant Orang Malayu by whom they have been absorbed.

These are the people once known as Orang Seletar (J. I. A. Vol. I.) and they, with all the above, belong to the Sea-Jakun, or Orang Laut, branch of the Proto-Malays. Except for a small party on the Sungei Masai, merely brought down by a Chinaman to cut fire-wood, I could ascertain no traces of the inland division south of a line drawn between the Batu Pahat and Sedili Rivers. In this latitude they are to be found on the Lenggiu and Sayong streams, the head waters of the Johore. In this connection the cropping up of the parong legend given above is interesting as it shows that the state of affairs was other in the past.

The remaining Orang Senimba live on the shores of Senimba Bay, behind Pulo Sambu—though Logan speaks of them as essentially a forest people—and do a little fishing, cultivating and fire-wood cutting. They are now Mohammedans which is to say that they have lost all ethnographical individuality.

But in the interior of Batam still exist an almost unspoilt people who, although the island is so small and they are nomadic, never come down to the sea. These are evidently Logan's "Orang Muka Kuning" (for his other tribe the Treng-Bubong" appear to have shared the fate of the Sabimba) although the name seems unknown to the shore people. I have not seen them personally, for living in temporary shelters and wandering about, they are not easily met with during a short visit but it was stated that they are less than a hundred in number. They trade a little jungle produce occasionally and wear bark *chawats* when they possess no cotton garments.

The most interesting fact in connection with them is that they still use the sumpitan and ipoh poison. They do not themselves manufacture the weapon but use one of a Borneo pattern obtained by trading. My informants assured me that though the poisoned darts were effective against wild animals yet they would never kill a fowl.

A similar tribe occupies the interior of Pulo Galang where a Belgian Planting Company has recently had some communication with them.

As these are probably the only island tribes who have maintained practically uncorrupted their paganism and their isolation, speedy investigation is most desirable.

The White-Handed Gibbon.

So far as I am aware the white-handed gibbon (*Hylobates lar*) has been regarded as an animal restricted in range to the mainland of Asia, inhabiting there the Tenasserim Province and the Malay Peninsula only. I therefore wish to place on record its occurrence in the swampy regions of East Sumatra, where it has been met with in large numbers by Dr. W. L. Abbott and myself, particularly in the Siak and Indragiri districts.

It occurs there, as elsewhere, in the biscuit-coloured, in brown and in sooty pelage, and as far as my observations are worth anything it is impossible to consider these varieties as colour races in any way. I have several times noted, though this does not seem to be general, dark females with pale infants and vice versâ and have also shot pie-bald adults with the colours so distributed that it would be impossible to say whether they are dark-furred individuals becoming pale or pale becoming dark. As however the pale form is comparatively scarce it is to be inferred that the latter metamorphosis is what is happening and that the light specimens are born so.

The statement that gibbons are monogamous is one that I thoroughly agree with: whether however they divorce each other and take new partners from time to time we have yet to learn. The point is interesting since such an able reasoner as Westermarck (The Origin of Human Marriage) has come to the conclusion that the marriages of mankind are an inheritance from some ape-like progenitor.

I do not ever remember meeting Malayan gibbons in parties of more than five at a time, but the most usual numbers are four or less. A small district may often contain a large number of apes but the little groups seem to live quite independently of each other and do not combine. These parties consist of two parents and their off-spring of different births, but as a rule it seems that about the time the third infant appears the eldest is sufficiently adult to take a partner with whom it starts life on its own account.

It is thus rather interesting to note that while the lower monkeys of nearly all species go about in bands—*Presbytes obscurus* is inclined to pair, however—in the case of the man-like apes (with the exception of the chimpanzee, perhaps the most intelligent of them all; the siamang and the Indian hoolock) the social unit is the family. This is, by many authorities, held to have been the state of primitive man before he became intellectual enough to recognise the advantages derived from union.

While their inactive habits compelled the gorilla and orang and possibly primitive man to be practically solitary as otherwise they would have exhausted their food supplies, this is not the case with the gibbon the most agile of all the apes. I hope to contribute to a forth-coming journal some notes on the relationship between the gibbon's structure and its habits.

C. B. K.

Curriculum of a Course in Malay in Paris.

Hôtel du Mont Blanc Les Rasses s/ Ste. Croix
Switzerland, 3/2/08.

The Honorary Secretary,
Straits Branch, Royal Asiatic Society,
Singapore, Straits Settlements.

Dear Sir,

I am permitted by the Professor of Malay at the Paris School of Oriental Languages to communicate to you the enclosed programme of the curriculum of his department, which I venture to think may be of interest to some of the members of the Society. Should it be desired to print this programme in the Journal for the information of members, I am authorised to add that Professor Cabaton has (at my suggestion) given his consent thereto.

It is rather remarkable that France, which has very few Malay-speaking subjects, should possess a Professorship of Malay (once filled, it may be remembered, by the Abbé Favre, whose name is still held in honour in the East), whereas England has made no move in this direction. The fact seems hardly creditable to ourselves.

I am,
Yours very truly,
C. OTTO BLAGDEN.

ECOLE DES LANGUES ORIENTALES COURS DE MALAIS 1907-8.

Première année. *Programme du cours:* Eléments de malais classique (Principes de grammaire: a) Phonétique ou Etude des sons; b) Ecriture: alphabet arabico-malais et ses transcriptions en caractères latins; c) Etymologie on Formation des mots; d) Morphologie on Etude des formes grammaticales; e) Syntaxe). Exercices practiques.

Examen écrit: Version et thème malais.

Examen oral: Explication de textes préparés à l' avance; a) Interrogations sur la grammaire; b) sur l' histoire, la géographie et les mœurs des Malais péninsulaires.

Textes à préparer: Maleisch Leesboek voor Eerstbeginnenden (Livre de lecture, en malais, pour les débutants), fasc. I, p. 1-20; f. II, p. 5-25.

Ouvrages à consulter: Reclus (Elisée), Géographie universelle , t. VIII, p. 715 sqq. Swettenham (Frank), British Malaya, London, 1906. Dennys (N. B.), Dictionary of British Malaya. Montano (Dr.), Voyage aux Philippines et en Malaisie.

Deuxième année. *Programme du cours:* Le malais, langue d' échange de l' Extr.-Orient. a) Grammaire et syntaxe (Revision) ; b) Explication de textes tirés du *Bloemlezing* de G. K. Niemann; c) Exercises pratiques: Dictées au tableau, thèmes oraux, exercices de conversation; d) Traduction de lettres et de documents.

Examen écrit: Version et thème malais.

Examen oral: Interrogations sur la grammaire, la géographie, l' histoire et la religion des Malais.

Textes à préparer: Bloemlezing uit Malaische Geschriften, door G. K. Niemann. Pt. stuk (La Haye, M. Nijhoff) [Onthologie d' auteurs malais].

Ouvrages à consulter: Reclus (E.), Géogr. univ., t. XIV, Insulinde, p. 195-411. Wilkinson (R. J.), Malay beliefs.., London, Luzac, 1906. Skeat (W. W.), Malay Magic, L. 1900. Hondas (O.), L' Islam. Chantepie de la Saussaye, Manuel d' histoire des Religions: L' Islam, p. 253-312; Les Hindous, p. 313-432. Chailley-Bert (J.), Java et ses habitants, P., Colin, 1899, in-18. Leclercq (J.), Un séjour dans l' île de Java, P. Plon, 1898, in-18.

Troisième année (Diplôme). *Programme du cours.* Etude du malais classique et usuel; a) Place du malais parmi les langues malayo-polynésiennes. Affinités du malais et de plusieurs dialectes de l' Indo-Chine Francaise; b) Déchiffrement et explication de manuscrits et documents relatifs à la géographie, à l' histoire et aux mœurs des pays malais et de l' Indo-Chine; c) Particularités du malais parlé au Cambodge. Notions sur les dialectes malayo-polynésiens de l' Indo-Chine (Cam, jarai, radeh, etc.); d) Exercices practique.

Examen écrit: Version, dictée et thème malais.

Examen oral: Lecture et explication d' un texte manuscrit. Interogations sur la grammaire malaise, la géographic l' histoire et les mœurs des Malais de la Péninsuleet de l' Insulinde.

Ouvrages à consulter: Backer (L. de), L' Archipel Indien. Dulaurier (E.), Des langues et de la littérature de l' Archipel d' Asie, (*in* Revue des Deux-Mondes, 15 juill. 1841). *Et tous les ouvrages indiguês ci-dessus.*

Grammaires malaises de Tugault et de Favre (en francais); de Dennys et Maxwell (en anglais); de Gerth van Wijk et Tendeloo, (en hollandais).—*Dictionnaires* de Favre, de Tugault, de Klinkert, de Pijnappel, de von de Wall et van der Tunk (ces 3 derniers en hollandais).

Father Civet.

By R. O. Winstedt.

This tale is not to be confused with that rollicking farce *Musang Bĕrjanggut,* "The Bearded Civet-Cat;" it is merely a beast fable of the Aesop type. The tale and language is so simple that a literal translation would be tiresome. The following is the gist of it. Some villagers moved from their *kampong* up to a hill rice-clearing and left behind them a hen and two chicken which they could not catch. One day hen and chicken were looking for food in the scrub, when the chicken wandered away from the hen and met a huge civet-cat. Said the civet-cat, "How would you like me for a step-father, you fatherless little chicks? Tell me where your mother roosts to-night and I will come and woo her." "We all sleep at the end of the threshold to-night," chirped the chicken. "All right I'll come and meet your mother," said civet-cat. So the chicken went back to the hen and the elder chicken chirped all about their meeting with civet-cat and how civet-cat was coming to visit them at 'the end of the threshold' that very night. "Oh you very naughty tell-tale chicken" clacked the hen and removed with them to a cross-beam under the roof. And civet prowled in vain that night all round the threshold. The next morning civet-cat met the chicken again and scolded them for their deceit. "All mother's fault" chirped the chicken, "she was angry with us for telling you her roosting-place and moved to the roof beam." "Oh," said civet-cat, "well, where does your mother roost to-night; I am longing to meet her." "On the cross-beam under the roof" chirped the chicken. When they returned to their mother, she asked where they had been and they told the whole story. Then the hen was very angry and beat them for telling civet-cat of the roosting-place and removed and slept on the ridge-pole. In vain civet-cat searched that night also. Next morning the bigger chicken said to the tiny chick, "Come, let us go and tell civet-cat all about it or he'll be angry with us just because of mother's whims." So they set off and found civet-cat furious but appeased him by protesting their innocence and telling him of their new roosting-place on the roof-tree; and they vowed not to tell their whimsical mother that they had met him or had told him of her roosting-place. Then that night civet-cat crept up on the roof-tree and devoured the poor hen and her silly chicken.

Chěrita Pa Musang.

Sa-běrmula, maka konon ada-lah orang pěladang tiga běranak běrpindah dari kampong-nya diam di-ladang, habislah di-bawa-nya děngan ayam itek-nya sěmua sa-kali; těrtinggal-lah tiga ekur ayam-nya sa-ekur ibu-nya dua ekur anak-nya baharu sa-běsar těkukur bětina tiada-lah dapat di-tangkap oleh pěladang itu karna těrlalu amat liar-nya. Maka ayam yang tiga běranak itu pun tinggal-lah di-rumah yang kampong itu. Maka ada pun ka-pada suatu hari ia měnchari makan ka-dalam sěmak-sěmak di-darat rumah tuan-nya itu běrchěrai-chěrai jauh sědikit anak ayam yang dua ekur itu děngan ěmak-nya. Maka ayam itu pun běrjumpa děngan sa-ekur musang těrlalu běsar-nya. Děmi di-lihat anak ayam itu, maka ia kědua běradek těrlalu kětakutan-nya hěndak lari. Sa-tělah di-lihat oleh musang akan anak ayam dua ekur itu těrlalu suka-chita hati-nya sambil těrsenyum měněgur anak ayam itu děngan pěrkataan yang halus manis dan kělakuan-nya yang lěmah lěmbut kata-nya, "Hai anak ayam janganlah takut akan aku ini, karna aku sudah běrtobat běrbuat aniaya ka-pada hamba Allah taala." Maka kata pula ayam yang kědua, "Apa pula sahaya takutkan, karna sahaya kědua ini tiada běrbapa; ěmak sahaya ada bujang." Maka sahut musang itu, "Jikalau bagitu, ada-kah ěmak anak ayam lagi?" Kata anak ayam, "Ada ěmak sahaya." Maka kata

musang, “Jikalau bagitu, mau-kah anak ayam běrbapa tiri akan aku, karna aku pun bujang juga tiada běrbini: khabarkan ka-pada ěmak anak ayam katakan aku hěndak měminang dia. Di-mana ěmak anak ayam tidur pada malam ini?” Maka kata anak ayam, “Sahaya děngan ěmak sahaya tidur di-ujong běndul rumah itu.” Maka kata musang, “Baik-lah aku datang malam sěkarang hěndak běrjumpa děngan ěmak kamu hěndak měmutuskan pěrjanjian kahwin itu; biar-lah aku chakap sa-mulut.” Maka kata anak ayam itu “Marilah sěkarang ’pa musang běrjumpa děngan ěmak.” Maka kata musang, “Baik-lah anak, ’pa musang datang sěkarang.” Sa-tělah sudah běrkata-kata itu, maka anak ayam itu pun balek-lah měndapatkan ěmak-nya. Hari pun pětang-lah. Maka ibu ayam pun pulang-lah běrtiga běranak lalu těrbang hěndak tidur di-ujong běndul rumah itu. Maka kata anak ayam yang tua itu, “’Mak ’mak, aku tadi běrjumpa děngan ’pa musang; kata-nya hěndak měminang ěmak dan běrtanyakan těmpat ěmak tidur, ia hěndak datang sěkarang.” Kata aku ‘di-ujong běndul.’” Sa-tělah di-děngar oleh ibu ayam itu, ia pun marah-lah akan anak-nya, kata-nya, “Kamu ini těrlalu amat pandai bijak sangat.” Maka ibu ayam pun běraleh-lah pula tidur ka-atas alang rumah itu. Hata sakětika lagi hari pun malam-lah. Maka musang itu pun datang-lah měnchari ibu ayam itu di-ujong běndul rumah itu tiada-lah di-jumpa-nya. Maka musang pun sangat-lah marah akan anak ayam itu oleh sěbab měnipu dia; běrfikir di-dalam hati-nya ‘Baik-lah ěngkau aku pěrdayakan juga baharu puas hati-ku.’ Sa-kětika hari pun siang, masok-lah musang kadalam hutan yang běrhampiran di-bělakang rumah itu juga běrsěmbunyikan diri-nya hěndak měnantikan ibu ayam děngan anak-nya měnchari makan.

Hata, hari pun chěrah. Ibu ayam děngan anak-nya pun těrbang-lah turun ka-tanah měnchari makan kais ka-sana kais ka-mari dapat-lah sěmut-sěmut itu di-běrikan-nya ka-pada anak-nya dua ekur itu; anak-nya pun makan-lah, ibu-nya měnchari pula ka-těmpat yang lain. Maka takdir Allah subhana wa-taala těrbang-lah dua ekur bělalang kěrěnnyat hampir děngan anak ayam itu. Maka di-kějar oleh anak ayam. Maka bĕlalang itu pun hinggap-lah dĕkat musang itu. Maka anak ayam itu pun sampai-lah. Tĕlah di-lihat oleh musang akan anak ayam kĕdua bĕradek datang dĕkat dia, maka musang bĕrkata dĕngan marah-nya, "Hai anak ayam, apa bahasa kamu mĕnipu aku? Sa-malam aku datang hĕndak bĕrjumpa dĕngan ĕmak kamu; jĕnoh aku chari tiap-tiap ujong bĕndul, tiada aku jumpa." Maka sahut anak ayam itu dĕngan kĕtakutan-nya, "Ayohai 'pa musang; jangan-lah sahaya di-marah; sudah sahaya khabarkan ka-pada ĕmak sahaya; ĕmak sahaya pun marah akan sahaya bĕrkhabarkan tĕmpat tidur ka-pada 'pa musang langsong ĕmak sahaya mĕmbawa sahaya kĕdua bĕradek ini bĕraleh tidur ki-atas alang rumah itu." Sa-tĕlah di-dĕngar oleh 'pa musang itu padam-lah marah-nya akan anak ayam itu sĕrta bĕrkata pula dĕngan lĕmah lĕmbut-nya, "Ayohai anak ayam malam sĕkarang di-mana ĕmak kamu tidur khabarkan ka-pada aku bĕnar-bĕnar karna 'pa musang sangat-lah rindu dĕndam hĕndak bĕrjumpa dĕngan ĕmak kamu itu." Sa-tĕlah di-dĕngar oleh anak ayam kĕdua bĕradek itu akan pĕrkataan musang itu, sangat-lah kĕsukaan hati-nya kata-nya, "Bĕnar-bĕnar 'pa musang malam sĕkarang ĕmak sahaya tidur di-atas alang rumah itu juga." Maka kata musang "Baik-lah, aku datang malam sĕkarang." Sa-tĕlah sudah bĕrkata-kata, anak ayam itu pun lalu-lah tangkap bĕlalang dapat-lah ia sa-ekur sa-orang lalu di-bawa-nya ka-pada ĕmak-nya. Maka di-tanya oleh ibu ayam itu ka-pada anak-nya, "Ka-mana pĕrgi hilang lama sangat tadi." Maka lalu-lah di-chĕritakan oleh anak-nya dari-pada awal sa-hingga ka-akhir-nya sĕpĕrti pĕrkataan musang itu. Maka sangat-lah marah ibu ayam akan anak-nya lalu di-pukul-nya kĕdua-nya anak-nya itu. Maka anak-nya pun minta ampun-lah mĕngatakan tiada bĕrkhabar lagi. Sa-kĕtika hari pun malam-lah; itu ayam pun mĕmbawa anak-nya tĕrbang pula tidur ka-atas tulang bubong rumah itu. Hata sa-tĕlah jauh malam sĕdikit, musang itu pun datang-lah mĕmanjat ka-atas alang rumah itu rata di-chari-nya tiada bĕrjumpa juga sampai-lah siang di-chari-nya tiada jumpa, bau-bau ayam itu sa-imbas-imbas tĕrchium juga oleh musang itu, makin sangat marah hati-nya. Tĕlah hari siang, musang itu pun pulang-lah ka-dalam hutan di-darat rumah itu. Maka dĕngan lapar dahaga-nya tiada-lah tĕrhingga lagi marah-nya akan anak ayam itu dua kali sudah ia kĕna tipu.

Sa-tĕlah hari siang ibu ayam pun mĕnchari makan juga sĕpĕrti kĕlaziman sa-hari-hari itu. Maka anak ayam yang tua itu pun bĕrmuafakat dĕngan adek-nya, kata-nya, "Adek, biar-lah kita chari 'pa musang bĕrkhabarkan ka-pada-nya jangan kita di-marah-nya; akan kĕlakuan ĕmak kita, kita pula di-marah 'pa musang itu." Maka kata adek-nya, "Mari-lah, kita bĕrjumpa 'pa musang." Maka pĕrgi-lah anak ayam itu kĕdua bĕradek-nya ka-tĕmpat musang makan. Dĕmi di-lihat oleh musang anak ayam itu datang, maka ia pun marah hĕndak mĕnangkap anak ayam itu hĕndak di-makan-nya. Kata anak ayam, "Hai 'pa musang jangan-lah sahaya di-marah, bukan-nya salah sahaya; ĕmak sahaya sa-olah-olah-nya tiada mau bĕrlakikan 'pa musang, makin ia bĕraleh tĕmpat tidur sa-malam ka-atas bubong pula." Maka kata musang, "Kamu bĕrkhabarkan ka-pada dia pula, aku hĕndak datang?" Maka kata anak ayam, "Macham mana pula sahaya tiada bĕrkhabar biar ĕmak bĕrsiap akan tĕmpat tidur 'pa musang." Maka kata musang, "Sĕkarang usah-lah khabarkan lagi ka-pada ĕmak kamu aku hĕndak datang, diam-diam sahaja: jikalau di-tanya ĕmak kamu pun, usah-lah di-chakapkan malam sĕkarang." Maka kata anak ayam itu, "Ĕmak sahaya tidur di-tulang bubong juga; datang-lah 'pa musang sĕkarang tiada sahaya bĕrkhabar lagi ka-pada ĕmak sahaya itu." Maka kata musang, "Baik-lah anak, boleh-lah 'pa musang datang, jangan-lah khabarkan ka-pada ĕmak kamu lagi." Maka kata anak ayam itu, "Baik-lah 'pa musang." Maka sa-tĕlah sudah bĕrkata-kata itu, maka anak ayam kĕdua bĕradek pun pulang-lah mĕndapatkan ĕmak-nya. Maka di-tanya ĕmak-nya akan anak-nya tiada di-khabarkan-nya di-daleh-nya mĕnchari makan juga. Maka ĕmak-nya pun diam-lah.

Hata sa-kĕtika lagi, hari pun pĕtang-lah. Maka ibu ayam pun mĕmbawa anak-nya kĕdua-nya itu tĕrbang tidur di-atas tulang bubong juga. Tĕlah hari pun jauh malam, maka musang itu pun datang mĕrayap-rayap pĕrlahan-pĕrlahan mĕmanjat atap rumah itu. Maka sampai-lah musang ka-atas tulang bubong, maka di-lihat-nya ibu ayam itu tidur kĕtiga bĕranak. Maka tĕngah musang itu hĕndak mĕnangkap ibu ayam itu, maka tĕrjaga-lah ibu ayam itu mĕnĕngarkan atap itu sĕrok-sĕrak bunyi-nya bĕkas kaki musang bĕrjalan. Maka di-lihat oleh ibu ayam sa-ekur musang jantan datang hĕndak mĕnangkap dia. Maka ibu ayam kĕtiga bĕranak pun tĕrbang-lah kĕlalak tiada tĕntu hala di-dalam gĕlap gulita. Maka musang itu pun tĕrjun-lah dari tulang bubong mĕngikut tĕrbang ayam itu. Maka ayam itu pun jatoh ka-tanah kĕtiga bĕranak-nya. Maka musang itu pun datang-lah mĕnangkap ibu ayam sĕrta anak-nya yang kĕdua ekur itu dimamah-nya kĕpala-nya. Maka kĕtiga-nya pun mati-lah dimakan oleh musang itu di-bawa-nya ka-tĕmpat ia di-bĕlakang rumah itu dĕngan kĕsukaan-nya. Sa-tĕlah bĕrbiasa pĕnat lĕlah-nya sa-lama ini tadi, bĕroleh rĕzki yang tĕlah di-chari-chari itu, di-pĕroleh-nya juga. Ada-nya.

(Di-karangkan oleh Pĕnghulu Raja Haji Yahya bin Raja Muhammad Ali, di-mukim Chĕndriang di-dalam nĕgĕri Perak.)

Sindbad's Old Man of The Sea.

By W. George Maxwell.

It was in the fifth voyage of Sindbad the Sailor, after the shipwreck caused by the bereaved and vengeful roc, that he found himself upon an island where he met "an old man, "a comely person, who was clad from the waist downwards "with a covering made of the leaves of trees." The old man was sitting by the side of the stream sighing; and in answer to Sindbad's questions made signs, by dumb show, that he wished to be carried across the stream to some fruit trees on the further side. Sindbad, in pity, took him up on his shoulders, whereupon the old man twisted his legs "which were like the hide of a buffaloe in blackness and roughness" round Sindbad's neck. "I was frightened at him," "Sindbad's narrative continues "and desired to throw him down "from my shoulders; but he pressed upon my neck with his "feet, and squeezed my throat, so that the world became black "before my face, and I was unconscious of my existence, falling upon the ground in a fit like one dead. He then raised "his legs, and beat me upon my back and my shoulders and "I suffered violent pain; wherefore I rose with him. He still "kept his seat upon my shoulders, and I had become fatigued "with bearing him; and he made a sign to me that I should "go in among the trees, to the best of the fruits. When I "disobeyed him, he inflicted upon me, with his feet, blows "more violent than those of whips; and he ceased not to direct "me with his hands to every place to which he desired to go, "and to that place I went with him. If I loitered, or went "leisurely, he beat me; and I was as a captive to him. We "went into the midst of the island, among the trees, and he "descended not from my shoulders by night nor by day; when "he desired to sleep, he would wind his legs round my neck, "and sleep a little, and then he would arise and beat me, "whereupon I would arise with him quickly, unable to disobey "him, by reason of the severity of that which I suffered from "him."* It will be remembered that eventually, after many days of beatings and ill treatment, Sindbad got rid of the old man by making him intoxicated with fermented grape juice, and then beating out his brains with a stone.

After his escape Sindbad wandered for some days upon the island until he met some merchants who, when they had heard his story, told him who it was that he encountered. "This man" they told him "who rode upon thy shoulders is called the Old Man of the Sea, and no one ever was beneath his limbs and escaped from him excepting thee."

The whole of Sindbad's personal narrative points to his adventure having been with an orang utan (simia satyrus): the difficulty, the only difficulty, but the whole difficulty, is the name ascribed to his persecutor by the people whom he met after his escape. Hole, in his commentary, suggested that the "Old Man" was an orang utan, but the qualifying words "of the Sea" so baffled him that he was prepared to consider them a mistake. "I would willingly suppose" he wrote, "the phrase 'of the sea' to be an addition of the trans- "lator, not countenanced by the original: or that it was "applied to Es-Sindbad's persecutor merely on account of his "insular abode, or usual appearance by the sea side. If "either of these conjectures be allowed we may pronounce "him, without any hesitation to be an *orang outan.*" Hole then goes on to give his reasons for his opinion.

Lane agreed with Hole that the "Old Man" was an orang utan, and supported the theory that the words "of the sea" merely denoted the insular abode.

Burton scoffed at the idea: "the inevitable orang-utan" was his jeering comment. But his own suggestion does not seem worthy of much support. The story is, he says "a "jocose exaggeration of a custom prevailing in parts of Asia "and especially in the African interior where the tsetse fly "prevents the breeding of burden-beasts . . . . . In

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* Lane's translation.

"Central Africa the kinglet rides on a slave, and on cere-"monious occasion mounts his Prime Minister." The weakness of the connection of ideas is however apparent. The custom of one man being carried by another does not convey the impression of the unnatural, clinging, unshakeable, creature with which Sindbad was saddled. For an explanation of the expression "of the Sea" Burton had recourse to the classics. "The classicists," he wrote "of course, find the Shaykh of the Sea in the Tritons and Nereus, and Bochart (Hiero ii 858, 880) notices the home aquaticus, Senex Judaeus and Senex Marinus."

But he has made no attempt to show any connection of ideas between the Man-riding Man and the Water-Man. The five arguments which Hole adduces in favour of the orang utan theory may be briefly enumerated as follows:—

1. The old man never speaks, but expresses his wishes by signs.

2. He apparently lives solely on fruit.

3. Though his face is like that of a human being, the hide of his legs is like that of an animal.

4. The "pressing," the "squeezing" the "winding" of the legs.—[Any one who has kept a pet orang utan, wah-wah (Hylobates lar) or siamang (H. syndactylus) as a pet knows the almost wild despair with which it clings to its master, as if it would suffer itself to be torn to pieces rather than be removed.]

5. The well known partiality of apes and monkeys to intoxicants, and the extreme quickness with which they become intoxicated.

A sixth point, which was probably unknown to Hole, but to which considerable weight may be attached is that stories similar to Sindbad's story are told to his day of the orang utan by the Dyaks. Hugh Clifford's "Story of Chaling, the Dyak" is very like the adventure of Sindbad. Chaling, it will be remembered, was carried off by a female orang utan to its platform on a forest tree, and for many days was unable to effect his escape.

The principal objection to the orang utan theory is that Simia satyrus is red, and not black. But in explanation of this I would suggest that there has been some confusion between Simia satyrus, which is red, and hylobates lar which is black. *At the risk being considered fanciful, I am even prepared to suggest that the white beard, with which some some old versions of the Arabian Story and the modern illustrator to Lane's translation have adorned the "Old Man" are an embelishment of the white ruff of Hylobates lar. A minor objection is the fact that grapes do not grow in the countries where the orang utan is found. Toddy, however, and other similar intoxicants are well known; and it is not improbable that the words "grape juice" were inserted by some copyist.

Let us take it that Sindbad's persecutor was an orang utan. How do we get from orang utan to "Man of the Sea"? Simply, I think; through the Malay. "Man of the Sea" (orang laut) is a mistake for "Man of the Forest" (orang utan).

It is well known that orang utan has two meanings: it is the name for the ape, and is also the generic name for the aborigines. They are known as orang utan; orang bukit, (men of the hills); or, in the case of the tribes driven inland, orang dalam (men of the interior), or orang darat (men of the land); whilst in contradistinction to the latter, the tribes driven to the coast are known as orang laut (men of the sea).

Thus the Sakei are divided into Sakei laut and Sakei darat, in the same way that Dyaks are divided into Sea-Dyaks and Land-Dyaks.

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* In the account of Sindbad's adventure in his third voyage, in the Island of Apes, Lane's translation describes the apes as being "covered with hair like *black* felt," while in the Calcutta edition and Langlès' edition they are described as "*red* downy creatures." I suggest that the mariner who described the animals as red was thinking of the orang utan, and that the other who described them as black was thinking of the wah-wah. A similar confusion seems to have been made in the case of the "*Old Man.*"

It is easily therefore to make a mistake between a "man of the sea" and a "man of the forest," for both are of the same stock; and it is equally easy to make a mistake between the aboriginal and the ape, for both are known by the same name. And this is the mistake that I think has been made. The position may be briefly put thus:—what the merchant said to Sindbad was "you've met an orang utan:" what Sindbad has recorded is "you've met orang laut."

If this is conceded, it would appear that Borneo is the island of the adventure with the "Old Man," (Lane suggested Sumatra, where the orang utan is also found) and that Sindbad's tale and Hugh Clifford's tale are but slightly different versions of the story (founded perhaps on fact) which is told by the Dyaks regarding the gigantic ape that, to this day, is the most typical inhabitant of their forests.

Postscript. I have, since this note was set up in type, come across a mistake which is exactly similar but even more extraordinary. On page 175 of Volume II. of "Asiatick Researches" will be found a curious confusion between the Thibetan Yak and the manatel or dugong. Two more dissimilar animals could hardly be imagined; but one is the "Mountain-Cow" and the other is the "Sea-Cow;" and "Mountain-Cow" and "Sea-Cow" have been confused in exactly the same way that "Forest-Man" and "Sea-Man" have (I suggest) been confused.

W. G. M.

Spada.

One of the first words that a visitor to Java or Sumatra hears is "spada." It is, in the hotels of the Dutch Colonies, the common call for a servant; a person shouts "spada" in the same way that in this Colony he shouts "boy" and in the same curious way the servant, wherever he may be, shouts back "tuan." The word is not a native one, and is not used by the natives.

The derivation usually given of the word is a corruption of two Malay words "siapa ada" (is anyone there?).

I do not know however whether any one has suggested that the word dates from, and is a survival of, the days of British rule in the island now under the Dutch flag. Such however is probably the case. The use in the Bengal Presidency of the call "koi hai" (is anyone there?) is so well known that a civil servant of that Presidency is generally known as "Qui-hai."* I suggest that "siapa ada" is merely the translation of "koi hai" and that it was introduced by the servants of the Honourable East India Company who had served in Calcutta before they came further east. "Siapa ada" certainly is not idiomatic Malay, and would not ordinarily be used by Malays in the sense in which, in this case, "spada" is.

Probably it is this very fact, quite as much as the open vowel sounds of the syllables, that have led to its present corrupted and contracted form.

If my suggestion is correct, two curious facts are worthy of note: first, that in India it is the caller and in the Netherlands Indies it is the person called that is known (in each case

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* It has even passed into the French language.

In the "Correspondance avec sa famille" of Victor Jacquemont therre is the following passage (Vol: II. page 308 :)

"J'ai vu dans vos gazettes de Calcutta les clameurs de *quoihaes* (sobiquet des Européens Bengalis de ce cote) sur la chaleur."

Jour. Straits Branch, R. A. Soc., No. 50, 1908.

by the alien nation) by the words of the call; and second, that the call survives only in a country that has ceased to be under British rule, and does not survive (if indeed it ever was known) in the Colony of the Straits Settlements.

W. G. M.

Two New Species of Cicindela (Tiger beetles) from Borneo.

By Dr. Walter Horn.

Cicindela Hewittii, new species.

Cicindela phalangioide, Schw. Geb. affinis differt statura majore latioreque, tota fere labri latitudine punctis setigeris occupatis (parte marginali solummodo impunctata) clipei angulo laterali, fronte supra antennarum insertionem et discoidaliter intra anticos oculorum margines (his sparsissime) pilosis, inter oculos multe minus excavata; pronoti disco planiore, sulcis transversis (proecipue antico) evidenter minus profundis, apice basique declivibus strangulationem basalem versus abruptius constricte (marginibus lateralibus), in parte media magis parallelis) lateraliter sat late sparsimque piloso, elytris pone angulum externum apicalem minus sinuatis; punctis insculptis (postice vix) antice paullo minus profundis ut sculptara tota valde (aequalis videatur); pedibus brevioribus (sed longis) femoribus distaliter minus late flavescentibus. Tota corporis superficies cum femoribus cupreo-brunnea, tibiis (proximaliter plus minusve flavescentibus) tarsisque caeruleo-viridibus, 4 primis antennarum articulis viridescentibus, (hic inde cuprassentibus) corpore subtus viridiaeneo, hinc inde paullulum caeruleo variegato) lateraliter plus minusve cuprasseatibus. Long 6½ mm (sine labro) 1 mascula; Kuching, Borneo VI. 1903 A. Dom. J. E. A. Lewis captus.

The three first articulations of the maxillar palps hardly, the trochanters mostly greenish. Anterior margin of the labrum a little concave and without any teeth. Yellow margin of the elytra thin running from the shoulders up to the apical spine but a little interrupted behind the shoulder. Cheeks, prosternum and episterna of pro. and mesothorax sparingly covered with long bristles. Mesosternum anteriorly bald, posteriorly shortly and sparingly pilose. Disk of the metasternum (posterior part of it bald), of the posterior coxae (the same for the unier part of them) and of the abdomen densely covered with short bristles.

The meta-espisterna and lateral part of the posterior coxae, of the meta-sternum and of the abdomen with moderately long bristles closely set. Antennae and intermediate coxae and the humeral part of the epipleura of the elytra moderately pilose. Head and prothorax dull, elytra moderately shining with a very short sutural spine.

The species is very remarkable by the prominent eyes, form of the middle part of the pronotum, the moderately shining elytra; the pubescence of the clypeus, cheeks, frons, latral margin of the pronotum, pro-and metasternum and coxae.

It gives me great pleasure to dedicate it to the amiable director of the Museum of Sarawak who was kind enough to present me with the only specimen.

Cicindela spinicollis, n. sp.

Cicindela denticollis, similis, differt labro non recte truncato sed antice ariso, fronte pronotoque perparum grossius anguloso, genis antice sparsim irregulariter punctato-foveolatis; pronoto parte intermedia planiore angustissime longiore lateribus rectis anticem versim magis convergentibus, impressionibus transversis longitudinalique media levioribus, angulis posticis simili in modo dentiformibus, sed hoc dente visu verticali) magis lateraliter directo (declivitate postica minus anguli paullo minus alta et grossim rugata; plica illa antebasali in illa specie a dente oriente et transversaliter intus ducta, in nova specie paullo minus evidente et post dentem originem habente) elytros faeminae macula nigricante solummodo submicante discoidali ornatis, spina suturali magis retracta et longiore totis densius, indistinctiusque punctatis; signatura flavescente valde reducta; macula basali media perparva, vix percipienda, linea tenui humerali marginali brevi, alteraque angusta apicali a spina usque ad angulum apicalem extrorsum ducta. Long 8¼ mm.

One female from North Borneo. The labrum is yellow without any distinct tooth, clypeus and frons bald and finely rugulose, the eyes indistinctly striolated. The pronotum shows a little before the hind angles a laterally prominent tooth, which stands about the same height at the ordinary basal transversal impression; about in the middle between this tooth and the basal margin runs an indistinct elevation (accompanied by a sulcus behind it). In *C. denticollis* this elevation is better developed and takes its origin just *from the basal tooth (the whole middle pronotum is also much broader transverse, etc.) The colouration of the upper side of *C. spinicollis* is a little darker and more dusky brownish brassy than in *C. denticollis;* the puncture of the elytra is finer and less distinctly developed. The cheeks are finely lineated and have at their anterior half some irregular punctiform impressions. The episterna of the prothorax are only at their inner part (sparingly those of the meso and metathorax everywhere moderately densely pilose; the lateral part of the metasternum, posterior coxae and abdomen are densely pilose. The posterior end of the yellow humeral slope and the anterior end of the apical one are indistinct. The four basal articulations of the feeler coppery brassy, femora greenish brassy with the extreme base and a longer part of the apex yellow. Trochanters yellow. My only specimen does not show any bristles at the lateral margins of the pronotum but they might be spoiled.

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* The same for *C. Wallacei* Bat., where the antebasal elevation is about as indistinctly developed as in the new species, but the pronotum of Bates, species is broader an anteriorly not narrowed, the elytra are much longer and more parallel etc., *C. Wallacei* Bates occurs in Celebes.

Some time ago I became doubtful whether the locality, I had once given for *Cicindela denticollis* (i.e. New Guinea) was exact, as I have never seen other specimens but the two types, the question has to be kept still in suspense.

Bats in a Bamboo.

A large clump of the bamboo *Dendrocalamus pendulus* Ridley which had died after flowering in the Botanical Gardens Singapore was being cut down in May and one of the coolies while cutting the culms up into lengths and splitting them noticed a strange noise within a joint. On splitting it up three or four bats flew out but there being more inside he brought it to me tied up. On taking it to the museum and carefully opening it Dr. Hanitsch and I found no less than twenty-three bats of which four were adult females and nineteen were young ones. One of these was still clinging to the mother and sucking. The joint of bamboo in which these bats were enclosed was a foot in length and the diameter of the hollow inside was 2 inches. The septa at each node were perfect and unbroken, and the only possible entrance was made by a crack on one side which allowed of a narrow slip to be pushed outwards so that a triangular aperture a quarter of an inch across in its widest part appeared in the upper septum.

Through this very small space all these bats must have crept. The inside of the bamboo was wet and dark coloured and there were some dipterous larvae within.

In another clump of the same kind of bamboo, two other joints containing young bats of apparently the same kinds were opened. In one joint when opened, it having been felled and left for some days in the sun all the bats were dead and decomposed. They nearly filled the joint and were apparently about thirty in number. In the other several bats had escaped but there were a number of young ones and one half grown. Specimens of these bats were sent to the British Museum where Mr. Oldfield Thomas examined them and found them to be *Tylonycteris pachypus*, (*Vesperugo pachypus* Dobson). He writes, "This bat has an exceedingly flattened skull and thus many account for its ability to get through a crack only a quarter of an inch wide. I never heard of specimens found in such a place before."

H. N. Ridley.

The Labiates of the Malay Peninsula.

By H. N. Ridley.

The *Labiatae* in the Materials for a Flora of the Malay peninsula have been described by Dr. Prain who gives eighteen genera and thirty species of this order as occurring in the Malay peninsula. Like the *Compositae* the Labiates are very poorly represented all through the rain forest region. They are inhabitants of open country and being all small plants and being dispersed chiefly by the mere sprinkling of their seeds as the wind blows, can neither push their way into our dense forests nor establish themselves there in the thick shade if they did get there. The only forest species indeed that we possess, the Gomphostemmas, have been so far modified for forest life that their fruits are developed into small white pulpy drupes, which can be eaten by birds and so the seeds dispersed. An analogous case among the Rubiaceoe with capsular fruit is seen here too in *Hedyotis congesta* belonging to an open country group of capsular seeded weeds in which also the fruit is developed into a small white pulpy berry.

The species recorded in the Materials are as follows:

Ocimum sanctum, L. *O. Basilicum,* L. *O. gratissimum,* L. (and *O. canum* might be added.) *Orthosiphon stamineus,* Benth. *Hyptis brevipes,* Poit. *H. suaveolens,* Poit. *Plectranthus Kunstleri,* Prain! *Coleus atropurpureus,* Benth! *Pogostemon Heyneanus,* Benth! *P. Cablin,* Benth. *Dysophylla auricularia,* Bl! *Mentha javanica,* Bl. *Calamintha gracilis,* Benth! *Salvia coccinea,* Juss. *S. plebeia,* Br. *Scutellaria discolor,* Colebr! *Anisomeles ovata,* Br! *A. malabarica,* Br. *Leonotis nepetifolia,* Br. *Leucas martiniceusis,* Br. *L. zeylanica,* Br! *L. lavandulifolia,* Sm! *Leonurus sibiricus,* L. *Paraphlomis rugosa,* Prain! *Gomphostemma microcalyx,* Prain! *G. crinitum,* Wall! *G.*

Scortechini, Prain! *G. Curtisii,* Prain! *Cymaria dichotoma,* Benth! *Acrymia ajugiflora,* Prain! Those marked "!" are the only ones which can claim to be really indigenous.

The Basils, *Ocimum* and the Mint, *Mentha javanica* are garden pot herbs which can hardly be said to have established themselves anywhere. The Mint quoted only from Malacca, Griffith, has long been cultivated. It seldom flowers here, and I have never seen it outside a garden plot. *Salvia coccinea,* Juss. and *Orthosiphon stamineus* as far as our region is concerned are only to be met with in flower beds. The *Orthosiphon* "Kumis Kuching" of the Malays is however a native of Siam and may be found wild across our borders in the extreme north.

Leonurus nepetifolia, Br. is also a cultivated plant only to be found in gardens.

Anisomeles malabarica, Br. only met with in Penang town suburbs, is obviously an introduction from India probably by Tamils. It was collected in 1822 in Penang by Wallich.

Leonurus sibiricus is brought in and cultivated by Chinese who use it in medicine.

Salvia plebeia, Br. is only recorded from Malacca without collector's name, probably the specimen was from an introduced plant. *Leucas martinicensis,* Br. is also an introduction. It has only been obtained by Scortechini in Perak.

None of these plants have ever established themselves as weeds, and can only be classed as Garden escapes.

Thoroughly established here as all over the tropics are the two American *Hyptis, H. suaveolens* and *H. brevipes.*

The rest of the list fall into three groups (1) herbs occurring as weeds only in cleared ground near cultivation, but certainly natives of this area. These are *Coleus atropurpureus,* Benth., *Anisomeles ovata,* Br., *Lencas zeylanica,* Br. and *L. lavandulifolia,* Sm. and *Calamintha gracilis,* Benth. This latter I found in some quantity at the foot of the Thaiping hills in open ground. It has otherwise only been found in Java and once in Assam.

(2). Herbs growing in the jungles and obviously indigenous the *Gomphostemmas,* and I believe *Pogostemon Heyneanus,* Benth. the Indian patchouli.

The *Pogostemon* is not so far as I am aware cultivated here, but it is possible that it is. I have met with it on stream banks in forests, at Rawang in Selangor (No. 7603 of my collection) and at Taka Tahan on the Tahan River (No. 2031) also in Sarawak at Lundu (No. 1238) and it is in Haviland's collection from Penkulu Ampat in Sarawak. In the Tahan River locality it was growing near *Colocasia antiquorum* at an old Sakai camping ground, and was probably carried there by the Sakais, but there was nothing to suggest it had been introduced in the other localities. It is known to the Malays as Rumput Ruku, Poko Nijao, Nilam Bukit and Chilam Bukit. It is used as a poultice in cases of headache, rheumatism and boils, and in the form of a decoction is drunk for dropsy. The flowers the colour of which is not given in the Materials are pale violet.

P. Cablin, Benth. the commonly cultivated patchouli is described fully in the Materials. Its native home is quite unknown.

Dysophylla auricularia, Bl. is undoubtedly wild here, I think. It grows in swampy open ground, edges of rivers, etc.

Scutellaria discolor, Benth. was once collected by Scortechini in Perak and is probably wild. I have never seen it.

(3). The third set of indigenous Labiates are all from the limestone rocks of Ipoh and near by. They are *Plectranthus Kunstleri,* Prain., *Paraphlomis rugosa,* Prain. and *Cymaria dichotoma,* Benth., *Acrymia ajugiflora,* Prain. The occurrence of four species of this order out of so small a number of indigenous species on such a limited area as this range of limestone hills is very remarkable.

Thus this large order is represented in the Malay peninsula by only 15 species which can be considered to be truly indigenous.

The Crackling Moth.

By H. N. Ridley.

It is not unfrequent when passing along roads through woods, just after dusk has set in to hear all around a strange crackling sound not very loud but quite distinct and resembling somewhat Chinese crackers heard at a distance. This is produced by a black moth of some size, which seems to be hardly distinct from *Nyctipao hieroglyphica* as figured in Hampson's moths of India, and Moore's Lepïdoptera of Ceylon. I do not find any mention of the peculiar behaviour of this insect made anywhere in these works, so I will give some account of it. The moth is three and a half inches across the wings, which are rather longshaped and scolloped along the edges, wings and body are of a deep brown black, above and below and on the upper wing near the tip is a yellow mark something like an 8 but with the loops more oblong and angled and the neck more distinct. In the centre of the upper wing is a faint shadowy eye formed of two rings of black one inside the other, the centre of a slightly paler brown colour than the rest of the wing. On the underside the yellow spot is seen but not so bright in colour, the peacock's eye is invisible and there is another small yellow spot lower down on the upper wing. The body is cylindric black, and the antennae are wiry and black. The insect differs from the figure of the Ceylon form, in Moore's Lepidoptera of Ceylon, in its darker colour and very indistinct eye, which in the Ceylon form has some chestnut red in the centre, (*Argiva hieroglyphica* Pl. 165) but it is perhaps a local form. The insect above described is a male. The females have a white spot on the upper wing.

During the day, the moth hides under roots or in crevices of rock where it is quite dark, as do most species of the genus, and if disturbed dashes off to seek another hiding place. I

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have seen it thus in the garden rockery, and in the Bukit Timah forests. It leaves its resting spot about half past six in the evening and betakes itself to an open road or path. Here it flies briskly backwards and forwards, in the shadows, and at such a pace that owing to this and its dark colour making it so invisible, it is very difficult to capture. Often half a dozen or so are dashing about the road at a time and they keep to specially favoured spots, night after night. They do not make any noise when flying about singly, but when two are flying about chasing each other they produce the strange crackling sound described above. Owing to the darkness it is impossible to see how they do it, neither am I sure whether it is effected by a pair or by two males only. I have only caught males. They remain till it is actually quite dark, but then seem to disappear. Neither light nor cow-droppings which are often attractive to moths engage their attention. They keep just out of the light of the road lamps. When by a lucky stroke one is secured in the net, it is usually very quiet and does not flutter about, so that often one does not notice at first that it is trapped, but so fast it flies and so hard one has to strike at it that the insect is very apt to be damaged by the concussion.

It appears at the end of May. This habit of dashing about the roads and its peculiar crackling noise, are not shared with any other Nyctipaos as far as I know.

A larger species with brown wings ornamented with white eyes, is one of our commonest moths and often comes to light. It rests during the day under rocks or banks, or on beams in sheds or houses and though rapid in flight when disturbed, merely dashes from one hiding place to another, and I have never met with it dashing about the road at night in the way that *N. hieroglyphica* does. The latter is abundant in Singapore and I have also met with it in Pahang and other parts of the peninsula.

Nothing appears to be known of the life history of this moth.

H. N. RIDLEY.

New or Rare Malayan Plants.

Series IV.

By H. N. Ridley.

It will be seen by this series of novelties that the knowledge of our flora even of the best known spots is not yet complete. Even in Singapore with its nearly exterminated native flora, still some novelties lurk in the few remaining bits of forest, thus the Stagmount wood produced the beautiful new ginger which was found growing in a spot which I have frequently visited and only a few yards from my usual track. The *Randia,* the *Heritiera* and *Diospyros* described herein I have known for many years, but they have not been described in the Materials and so are now published for the first time.

The well known furniture wood Katinga from the Siamese borders has long been prized and I obtained leaves and a fruit some years ago from Mr. F. G. Penney, who had a fine collection of furniture made from its wood. A number of young plants were raised in the Botanic Gardens, and I lately obtained specimens shewing parts of the flower from Mr. H. C. Robinson. It proves to be a *Murraya* allied to the well known Kamuning wood, so much valued for the handles and sheaths of Krises.

The low-lying forest region of Southern Johore, has produced several interesting novelties, including a remarkable new genus of gingers, but many more curious and interesting plants will be found in this unexplored district when time serves to investigate it. From Sarawak Mr. Hewitt still continues to send many more novelties, and among Sarawak plants I am glad to be able to associate the name of the

Founder of our Society with the beautiful climber, *Hosea Lobbiana,* the ladder to the moon, (Tanga Bulan) of the Malays. This charming plant abundant in the swamps near Kuching, has been more or less known for a long time. Thomas Lobb while collecting plants for cultivation for Veitch found it and dried a spray of it which is now at Kew, but Lobb does not seem to have troubled to put localities on the tickets of his dried specimens, and when his collections were received at Kew, many were wrongly localised, and this plant was supposed to have come from Penang, and was described as thence by Clarke in the Flora of British India as *Clerodendron Lobbiana,* (the peculiar fruit however prevents it from being a Clerodendron).

Miss North saw it at Kuching and made a drawing of it, which however was not recognized as Lobb's plant. Bishop Hose brought plants of it into his garden at Kuching, and some years ago gave one to the Botanic Gardens in Singapore where it has been cultivated. It seems of slow growth and not very easy to propagate, so that it has not been found possible as yet to distribute it to other gardens. It is a most attractive plant with its red upper leaves and salmon-orange flowers. A contrast to it is the dwarf *Clerodendron pumilum* from the road banks of Matang mountain in Sarawak, perhaps the smallest of clerodendrons, though with a fairly large tuft of white and pink flowers.

STERCULIACEAE.

Heritiera elata, n. sp.

A gigantic tree 100 feet tall 2 feet through with strong buttresses, bark grey flaky. Leaves coriaceous elliptic obtuse with a round or truncate base 4 inches long 2¾ inches wide smooth shining above, coppery scaly beneath, nerves 5 pairs elevated beneath, inconspicuous beneath, petiole ¼-½ inch long. Panicles axillary on the branches in the axils of fallen leaves about five inches long, lax many flowered about 4 inches long, all densely covered with stellate hairs. Male flowers pink campanulate shortly 5 lobed $^1/_2$ inch long, covered with stellate hairs outside. Androecium very slender $\frac{1}{3}$ the length of the tube, anthers in a whorl 5: disc large circular. Fruit on stout woody peduncles, obovate woody brown, with a subtriangular woody wing running to a point obtuse, $1\frac{1}{2}$ inch long, wing $\frac{1}{2}$ inch long. Seed oblong, cotyledons fleshy, no albumen.

Singapore: Gardens (Ridley 6015).

There are two or three of these fine trees in the Garden Jungle. The finest is a conspicuous object by the plant sheds growing close to a still taller *Palaquium bancanum*. The underside of the leaves is covered with a layer of coppery silvery scales circular in outline with numerous irregular teeth on the margin. These scales also occur on the upper surface of the young leaves. The Male flowers are produced in great abundance rosy pink in color. The females seem much scarcer. I have failed to find any on my specimens. The fruit has a much more distinct wing than has *H. littoralis* the common sea shore tree, but it is not sufficiently large to act in dispersing the plant. The fruits indeed simply fall in great quantities beneath the tree and most of them perish after a short time.

RUTACEAE.

Murraya caloxylon, n. sp.

A tree of considerable size the branches covered with a pale flaky bark. Leaves 8 inches or more long with 13 leaflets, rachis flattened and winged narrow, leaflets 3-$3\frac{1}{2}$ inches long or less by $1\frac{1}{2}$ inch wide, alternate oblanceolate obtusely acuminate with a triangular base, minutely petiolate inaquilateral thin bright deep green. Flowers pale yellowish green several together in small panicles, in the upper axils of a branch, about an inch long. Sepals connate ovate acute $\frac{1}{10}$ inch long. Petals and stamens not seen. Ovary stalked, hairy, style rather stout hairy, stigma capitulate. Fruit oblong rounded at both ends, 4 inches long and three inches in diameter, the pericarp dotted and warty greenish eventually becoming yellow, half an inch thick, lemon yellow inside, full of long resin cells narrowed at the mouth and dilated below, cells 5, with rather thick tough walls, pulp of transparent flattened sticky fibres olive green in colour and tasteless. Seeds numerous about 5 in a section ovate flattened half an inch long ⅛ inch thick, olive grey.

Southern Siam: Patani (Penney); Upper Perak: Kenering at 500 feet elevation (Robinson 5548).

This tree known as the Katinga is famous in the Malay peninsula for its beautiful wood. This handsome wood is of light yellow color, ornamented with dark brown streaks and strains, fairly hard in texture and taking a good polish. Mr. F. Penney obtained a considerable quantity of the wood from Siamese territory North of Province Wellesley, from which he had made furniture, boxes, etc., which was very highly valued on account of its beauty. He obtained also leaves and fruit of the tree. For the flowers I am indebted to Mr. H. C. Robinson, who met with it in Upper Perak.

It differs from other species of the genus in the greater size of the leaves, the conspicuously stalked ovary, and the remarkable fruit which resembles a citron. The rind has a bitter terpentiney flavour, and the comparatively scanty pulp is quite tasteless. The fruit is so entirely different from that of any other species of the genus that the plant might almost be separated generically.

MELASTOMACEAE.

Osbeckia chinensis, L.

Has been sent by Mr. Fox from Setul in Southern Siam where it was collected by Mohammed Aniff, the

Foreman Gardener of Penang Gardens. This is a very widely distributed and variable herb occuring all over tropical Asia from India and Ceylon to New Guinea and China, but hitherto it has been wanting from the Malay peninsula. The form collected is the narrow leaved form represented by *O. angustifolia* as figured in Wallich's Icones Rariores.

RUBIACEAE.

Randia fragantissima, n. sp.

A stout woody climber, stem through bark of branchlets pale. Thorns in pairs strong woody ¼ to ½ inch long. Leaves elliptic acute to ovate acute coriaceous glabrous 5 to 7 inches long 2½ to 3½ inches wide, nerves about 10 pairs; petioles stout ½ inch long. Cymes terminal or lateral 2 inches across, 20 to 30 flowers in each. Flowers waxy white, fragrant. Bracts at the base of the flowers ovate pubescent, several on each very short peduncle, the terminal one double and resembling an epicalyx. Calyx campanulate pubescent ¼ inch long teeth 5 short acute. Corolla tube an inch long cylindric glabrous, lobes oblong obtuse ⅜ inch long, interior of the tube silky hairy. Stamens 5. Anthers nearly sessile in the mouth of the corolla, linear, base bilobed. Style stout longer than the corolla-tube with two flat elliptic lobes. Berry ¼ inch long.

Singapore: Garden Jungle (Ridley 5664), Bukit Timah (13022), Changi, Pulau Tekong; Malacca: Selandor (Cantley's Collector), Ayer Panas (Derry 1056), Bukit Bruang (Derry 274). Native names, "Akar Seburus;" "Akar Kuku lang."

A very beautiful climber when in flower with its tufts of pure white fragrant flowers reminding one of those of the *Stephanotis*.

MYRSINEAE.

Labisia acuta, n. sp.

Undershrub 18 inches tall, stem flexuous. Leaves about 12 lanceolate subacute equally narrowed at both ends, herbaceous dark above paler beneath quite entire, 4 to 6 inches long 1½ inch wide, petiole ¼ inch long winged to the base. Panicles in the uppermost axils dense-flowered, rufous scaly, 2 inches long lower part nude. Bracts lanceolate. Calyx campanulate 5 lobed lobes short. Corolla lobes lanceolate acute eglandular. Anthers eglandular.

Johore: Sungei Tebrau, March 1907 (Ridley 13010).

This really seems distinct specifically from the common and variable *L. pothoina*, Lindl. (*L. pumila*, Benth) in its elongate stem and acute petalled eglandular flowers.

Ardisia § *suffruticosa*, n. sp.

A low ascending undershrub little over a foot tall with a flexuous stem with brown longitudinally rugose bark. Leaves oblanceolate entire narrowed gradually to the petiole, apex obtusely acuminate, margins faintly undulate eglandular, glabrous, (bud leaves red pubescent) nerves inconspicuous above, beneath about 20 pairs slender, slightly elevated, 4-5 inches long 1 inch across, petiole slender ½ inch long or less. Inflorescence from the axil of an upper leaf; peduncle patent slender, 1 inch long, red scaly pubescent. Pedicels umbellate $\frac{1}{5}$ to ¼ inch long, few, about 7 occasionally umbellate. Flowers small pink. Calyx lobes 5 very small not overlapping lanceolate acute edges glandular ciliate. Petals $\frac{1}{10}$ inch long, lanceolate acuminate, obtuse. Stamens little shorter, filaments very short, anthers apiculate. Style little longer than petals in the open flowers. Fruit globose ¼ inch long, terminated by the remains of the style.

Johore: Sungei Tebrau in sandy woods, covering the ground (Ridley 13009) March 1907.

This species is allied to *A. divergens* but is a much smaller plant.

EBENACEAE.

Diospyros pyriferus, n. sp.

A tree about thirty feet tall with black bark. Leaves glabrous elliptic apex subacute or obtuse, base rounded, coriaceous 11-13 inches long 4 inches across, midrib stout prominent beneath, channelled above lateral nerves prominent beneath, depressed above about 13 pairs, alternate and irregular, meeting in loops within the margin reticulations conspicuous, petiole thick ¼ inch long. Flowers in fascicles on the trunk or branches, cream color. Cymes ¾ inch long much branched with slender branches covered with appressed hairs. Bracts small ovate. Calyx lobes small $\frac{1}{10}$ inch long ovate hairy 5. Corolla male, thick and coriaceous ½ inch long, tube flask shaped lobes rounded recurved all glabrous. Stamens very numerous, about 30 ,in pairs, the front and back ones connate in pairs by the filaments, the back one with a longer filament than the front one, filaments very short, anthers linear, tip acute. Female flowers not seen. Fruit pear-shaped glabrous green 3½ inches long, 2 inches through, pericarp inside white, seeds ten. Calyx broad ½ inch long green glabrescent lobes spreading ovate acute inch long.

Singapore: Bukit Timah, forest at the West entrance to the Fern Valley (Ridley Nos. 8101, 10847, 10442, 6118, 8114). Flowering April and October, fruit October.

Near *D. oblonga,* Wall. but with many more stamens and a very different fruit like a small pear.

LOGANIACEAE.

Fagraea rotundifolia, n. sp.

A shrub with short internodes and opposite round leaves, sometimes subretuse with a small projecting point in the notch, thickly coriaceous 3 inches long and as wide, petiole thick nearly half an inch long. Flowers solitary terminal subsessile. Bracteoles broad ovate. Calyx lobes ovate obtuse an inch long. Corolla tube straight tubular slightly dilate near the limb, 6 inches long ¼ inch through, lobes obovate rounded rather leathery 1 inch long ½ inch wide, apparently white. Stamens just protruding from the tube mouth, anthers oblong ¼ inch long. Styles as long as the capitulate.

Tringanu: Bundi (Rostado).

This fine plant is allied to *F. carnosa,* Jack, differing in the quite round leaves, and the very much larger corolla limb.

F. racemosa, var. *pauciflora,* King and Gamble.

I should certainly be inclined to consider this plant specifically distinct from typical *F. racemosa.* The typical plant is a large stout shrub or small tree common in the open country with flesh colored flowers in dense racemes. The variety *pauciflora* is a tall slender little-branched shrub, with a slender broken up raceme of white or creamy white sweet-scented flowers. It only occurs in dense wet forest and is not found with the common species. Thus the variety occurs in Bukit Timah forest, while *F. racemosa* does not occur at all in Singapore.

F. Ridleyi, King and Gamble.

This is not completely described as the authors had not seen flowers of it. It appears only to have been collected by myself once on the lower slopes of Mount Ophir and also on Bukit Timah in Singapore. The only plant I found in Singapore was growing as an epiphyte on a dead tree at the top of the hill. The tree later fell down and I believe the plant quite perished. Before it did so however, I managed to obtain a cutting and planted it in the Botanic Gardens where it has now developed into a large branching shrub about 12 or 14 feet tall. It first flowered in 1902, and set fruit. The leaves are dark green shining above, glaucous beneath, obovate with prominent nerves beneath, on the upper surface are scattered roundish elevations, corresponding to glands of a yellowish color beneath. The buds are protected by a white resinous secretion which become, buff yellow when exposed to the air. The flowers are in cymes of four, on short peduncles. Calyx lobes ovate blunt nearly an inch long. Corolla tube thick nearly 2 inches long pale orange green, the lobes oblong obtuse emarginate reflexed, white shaded with green 1 inch long ½ inch wide. Stamens long white, anthers oblong rounded pale violet. Style rather thick greenish. Stigma capitate emerald green conic about 3 inches long, ending in the stout style.

F. auriculata, Jack.

This the finest of all the Fagraeas, usually at least starts life as an epiphyte and killing its host becomes a very large branching shrub sometimes as much as 30 feet tall. The branches are straggling and flexuous, and armed with short sharp points on either side of the auricles of the leaves. Most of the descriptions of this plant as taken from herbarium specimens much underrate the size of the leaves and flowers. There seem to be two forms however in one of which the flowers are much smaller than in the other and commoner forms.

The flowers during life have the following dimensions. Calyx 3 inches long and 2 inches in diameter. Corolla tube 6 inches long and 3 inches across the mouth, lobes 3 inches across, and ¼ inch thick. The whole corolla is eight to 12 inches or more across. The stamens are three inches long, the style four inches with an emerald green stigma more than half an inch across.

The flower opens in the early morning and remains open for two days before falling, or turning yellow. It exhales a coarse rather musky, scent. The stamens have their anthers at first up-curved, but ere long they fall and lie on the lower face of the tube. The stigma is then not fully developed and not half as big as it eventually becomes. The stamens dihisce, and produce a quantity of white pollen when they are in a prone position. The flowers are now visited by the very small *Trigona (Tr ruficornis)*. These hover about the stamens, then settle and gather pollen, rise hover again and resettle. Occasionally they rest on the stigma, and deposit pollen thereon. Usually however the stigma is not developed till the next day, when the pollen is all gone, and if there has been rain, wet and spoilt, for it has no protection. On the second day, the stigma is fully developed, and has attained its full size. I have seen no other insect at the flower, though I watched for hawkmoths for a long time in the evening, none visited it.

The fruit is six inches long surrounded at the base by the thick green overlapping calyx lobes. These are ellipsoid rounded at the top and elevated in the centre, 3 inches long by 2 inches wide. The fruit is cone-shaped with a blunt top, polished lead-colour. When ripe it dehisces at the top into five lobes, covered with a sweet orange pulp in which the seeds are imbedded. This pulp is evidently derived from the placenta. The fruit often splitting and leaving the placenta erect in the centre and covered with the small seeds imbedded in the pulp. The pulp is sweetish with a strong unpleasant bitter taste and is very attractive to birds and ants. The seeds are irregularly angled, and finely reticulate. The seeds when deposited on a tree trunk germinate and the little plants as they grow emit long olive yellow roots like those of an orchid, which run upwards and downwards on the tree trunk, for a length of 6 or 8 feet or more. The plant branches from the base sending out 2 or more stems. Eventually it appears either to kill the tree or descend to the ground forming a tree of some size. The largest plant in the gardens has layered itself from one of the branches.

F. oblonga, King and Gamble.

This is incompletely described in the Materials for a Flora of the Malay peninsula, for lack of complete specimens. I would add the following notes to the description. It is an epiphyte with rather flaccid leaves for a Fagraea. The flowers are borne in pairs on axillary peduncles at the ends of the branches. The peduncles are an inch long and rather stout, as are the pedicels ¼ inch long. The calyx lobes are ovate blunt ¼ inch long. Corolla white, with a straight tube 1 inch long, the lobes ¾ inch long ½ inch wide oblong obovate with rounded tips. Stamens included, anthers oblong. Style an inch long, with a peltate stigma.

The plant occurs at the Tea Gardens and the Cottage on the Thaiping Hills and I have also found it at the Semangkok Pass in Selangor (No. 12069 of my collection).

F. fragrans, Roxb.

In the Materials for a Flora of the Malay Peninsula the description and quoted collection numbers for this plant include a tree very distinct in life but less easily separated from herbarium specimens. This species is I am pretty certain the plant intended by Blume in his *Fagraea speciosa* (Rumphia II. p. 33, tab. 81).

F. fragrans, Roxb. *F. peregrina,* Blume. Is a tree about 60 feet tall with a diameter of 1-2 feet. The bark is rough and thick deeply irregularly grooved, and brown. The leaves are elliptic acuminate narrowed at the base dark green dull with perfectly straight edges, nerves 8 pairs. The cymes are less lax than those of *F. speciosa*. The calyx lobes are short and ovate. The corolla tube ¼ inch long, trumpet shaped, the lobes oblong obtuse reflexed, as long as the tube. The stamens are long protruded, the anthers ovate, horse-shoe shaped, the loculi having a deep depression between them at the base.

The berry globose scarlet. Seed irregularly quadrate dark brown pustulate.

This plant is the Tembusu of the Malays, and a very well known and beautiful tree, whether in flower, covered with its masses of creamy white flowers scenting the air, or when bearing its bright orange red berries. It occurs in open country only, and comes up frequently in secondary scrub. In the Botanic Gardens it comes up everywhere in the grass plots where the seeds has been carried by bats or birds, or as I have seen by the fruit-eating ants. Specimens have been distributed from the Botanic Gardens herbaria under Gardens (Ridley 5817); Pahang: Pekan (1028); Penang: Telok Bahang (Curtis 314); Malacca: Merlimau (Derry 53). I have also met it wild in the Dindings and Province Wellesley.

F. speciosa, Bl. is a very different looking tree, which attains a height of 100 feet and a diameter of 3-4 feet. The bark is curious, being channelled in long straight grooves, much less rough than in *F. fragrans*. The leaves are lanceolate gradually narrowed to the petiole and long acunate, polished light green and conspicuously undulate even when dry, nerves five pairs. The cymes are more lax than in *F. fragrans*. The flowers orange yellow, and rather smaller. The calyx lobes more lanceolate, obtuse. Nerves 5 pairs. The corolla tube ¼ inch long but nearly cylindric, and the lobes lanceolate-obtuse much narrower and shorter than the tube. The filaments are twice as long as the corolla lobes. The style is long and yellowish with a capitate stigma. The berry is oblong in outline and always yellow.

This tree is an inhabitant of the dense forests, though there are a few in what is now open country in Singapore, at Tanglin, they are merely the survivors of an old long destroyed forest. The tree is known, as Tembusu paya, Tembusu Bukit, and Tembusu Tembaga and is valued for its timber which is of much greater size than that of *F. fragrans*. The timber is indeed so durable, that there is in the Garden Jungle, a stump of one of these trees, which has been felled upwards of fifty years ago. The wood of this stump is still very hard, and very resinous. On the top of the stump grows a fairly large tree of *Cumpassia Malaccensis.*

This plant has been distributed under, Singapore: Garden Jungle (Ridley 5818, 8921); Malacca: Bukit Sebukor (Derry 272).

It is by no means as heavy a flowerer as *F. fragrans,* and sets comparatively little fruit.

I have little doubt that Blume's *F. speciosa* is this plant, though he figures the flowers white. His plant was obtained in Java.

GESNERACEAE.

Didymocarpus Winkleri, n. sp.

Stem stout over three inches tall densely covered with appressed silky hairs. Leaves elliptic lanceolate obtuse narrowed slightly at the base slightly oblique, covered on both surfaces with appressed silvery silky hairs, 6 inches long and 2¾ inch wide, petiole silky hairy 3 inches long. Scapes strict erect several at the tip of the stem purple silky hairy 6 inches long including the inflorescence. Bracts linear lanceolate acute hairy narrow. Inflorescence panicled with short branches. Flowers numerous white. Calyx lobes lanceolate acuminate hairy, ¼ inch long. Corolla 1¼ inch long pubescent white, tube thick dilated upwards gradually, lobes rounded. Stamens 2, filaments sinuous, anthers semi-elliptic. Style nearly as long as the stamens, hairy. Stigma cup-shaped. Capsule cylindric acuminate slender pubescent an inch long.

Selangor at the Batu Caves near Kwala Lumpur (Dr. Winkler March 3. 1908).

This species is allied to *D. malayana* differing in its taller stem, more silky foliage and longer white flowers.

It was obtained by Dr. Winkler while making a short excursion to the well known caves.

ACANTHACEAE.

Polytrema cuprea, n. sp.

A slender creeping herb terrestrial. Leaves equal opposite ovate rotundate base rounded scabrid above, sub-pubescent beneath, margins pubescent, ½-1 inch long and about as wide, petiole ½ inch long, slender, dark coppery brown above paler beneath, nerves sunk on the upper surface. Flowers three or four on a short terminal cyme. Sepals linear acuminate very narrow spreading in fruit, scabrid pubescent brown, inside pinkish. Corolla ½ inch long pale rose, lobes oblong truncate, lower lobe with a bright yellow central patch. Stamens 2, filaments glabrous, anther cells oblong acute at both ends parallel. Pistil pubescent. Stigma capitate. Capsule ½ inch long clubbed 4 seeded. Seed half orbicular punctate.

Perak: at Telor Pinang near Ipoh. Oct. 1898 (Ridley 9769).

This pretty little creeper has been in cultivation in the Botanic Gardens for six years and living plants have been sent to Kew. It seems near *P. isophyllum,* Clarke, but that is a tall erect plant with very different and larger leaves, and axillary flowers. Like so many plants of this kind it constantly produces cleistogamous flowers so that the corolla is seldom seen.

VERBENACEAE.

Hosea, n. gen.

A woody climbing shrub, with opposite elliptic ovate leaves, petioled; the terminal leaves on the shoot partly or entirely red. Cymes long peduncled, axillary from the upper leaf axils, spreading, branches dichotomous. Calyx campanulate spathaceous bilobed pubescent, lobes ovate. Corolla tube slender long, lobes 4, three obovate one linear oblong. Stamens 4, filaments far extruded, anthers rounded. Style as long. Stigma lanceolate. Ovary four-lobed, 4 celled, with an ovule in each of the two cells: Fruit one or two in each flower, fusiform narrowed at both ends, apex acuminate 2½ inches long, pericarp leathery deep purple. Seed solitary elongate.

H. Lobbiana, n. sp. *Clerodendron Lobbiana,* Clarke Fl. Brit. Ind. Vol.

A tall slender woody climber. Leaves elliptic ovate 2-3 inches long 1½ inch wide glabrous polished green. Upper leaves on the shoot smaller pubescent, orange red, petioles ¼ to 1 inch long. Cymes in the leaf axils of the upper leaves spreading on peduncles 4 inches long pubescent, branches of cyme dichotomous lax, pedicels ½ inch long, all pubescent except the corolla. Calyx campanulate bilobed half an inch long yellowish green lobes about ½ the length of the whole calyx, ovate. Corolla tube slender nearly an inch long, whitish, lobes four, 3 rounded obovate ½ inch long ⅖ inch wide, one linear oblong smaller all light apricot-orange. Stamens 4 filiform projecting for 2 inches from the mouth of the corolla tube, crimson, anthers smaller rounded black, pollen orange colour. Style filiform as long as the stamens crimson. Stigmas very small, lanceolate green. Ovary 4 lobed, lobes rounded elevated. Fruit one or two elongate fusiform deep purple three inches long and nearly ½ inch through in the thickest part.

Sarawak: in hot open swamps at Kuching abundant (Hullett, Haviland b. y. s. d., Ridley 11726).

This beautiful plant is known to the Malays as Tanga bulan, (the moon ladder). It was first partially described by C. B. Clarke as *Clerodendron Lobbiana* from a specimen collected by Lobb and supposed to have come from Penang, but doubtless Lobb collected it at the locality in Borneo. It was cultivated for many years by

Bishop Hose in his garden at Kuching, and I have much pleasure in associating his name with the genus. Plants have been cultivated also in the Botanic Gardens in Singapore.

The peculiarity of the genus lies in its remarkable fruit, which is not baccate as in most species of the genus but one-seeded.

Clerodendron pumilum, n. sp.

A dwarf plant, suffruticose, stem 2 inches tall, with whitish longitudinally ribbed bark, pubescent above. Leaves few 2 or 3, broadly ovate acute, base rounded broad, margin undulate distantly denticulate 4 to 6 inches long, 2 to 3 inches wide covered with pale unicellular hairs on both sides, petiole ½ inch long. Peduncle ½ inch long. Cymes in a pair about 2 inches long and as much across, many flowered, pedicels and peduncle densely pubescent. Sepals 5 lanceolate acute ⅕ inch long green tipped with red and covered with red hairs. Corolla ¾ inch long, tube cylindric dilated at the base curved above pinkish, pubescent, upper part crimson lobes 5-6 obovate rounded creamy white, hairy on the back. Stamens glabrous crimson over ½ inch longer than the corolla tube, anther linear deeply bifid black. Style filiform crimson glabrous long. Stigmas subulate green. Overy subglobose obscurely 4 lobed.

Sarawak: Mt. Matang, above the bungalow on clay banks by the road (Hullett, Ridley 12300).

A pretty little dwarf species of *Clerodendron with a* large tuft of pink and white flowers.

ORCHIDEAE.

Oberonia filaris, n. sp.

Caulescent, stems flexuous 3-4 inches tall, leaves 7 to 12 ensiform acuminate 1 inch long ¼ inch wide. Spike very slender 4-8 inches long, floriferous to the base. Flowers very minute yellow in approximate half whorls.

Bracts lanceolate acute. Sepals ovate acute. Petals narrower linear oblong obtuse. Lip oblong retuse or emarginate as long as the petals. Capsule stalked, elliptic 3 angled, $\frac{1}{10}$ inch long.

Sarawak: Kuching (Ridley, Hullett Sept. 1903).

This is allied to *O. ciliolata,* Hook. fil. but is a much smaller plant, with a very slender filiform spike and more minute not ciliolate flowers.

O. longifolia, n. sp.

Stem less with long fibrous roots. Leaves about 5 elongate scimitar-shaped linear acuminate, articulated and separating from the articulations, when dry 8 inches long $\frac{1}{4}$ inch wide, articulations $\frac{1}{2}$ inch long. Spike slender 8-14 inches long, floriferous nearly to the base, flowers minute irregularly arranged. Bracts linear acuminate longer than the flower. Sepals ovate acute, petals linear obtuse lip three lobed, side lobes from near the base narrow linear, shorter than the midlobe, which is ovate obtuse minutely toothed. Column fairly long with short tooth-like stelidia.

Sarawak: Bukit Tendang, Busau Sept. 1905 (Ridley), Quop March 1908 (Hewitt).

Remarkable for its long narrow leaves, curved and acuminate and long spike.

O. rubra, n. sp.

Acaulescent. Leaves fleshy ensiform $\frac{1}{2}$-1 inch long, $\frac{1}{8}$ inch wide red. Spike 2-3 inches long, base shortly nude above densely floriferous. The flowers in closely packed alternate half-whorls below, in complete whorls above. Bracts linear acuminate entire as long as the flower. Sepals ovate lanceolate. Petals narrower, entire. Lip ovate entire centre depressed. Capsule stalked $\frac{1}{8}$ inch long subglobose 6 angled, the 6 ribs very prominent.

Sarawak: on coffee trees on Matang Estate (Ridley).

I have known this little plant for years but never had the luck to find a flower in fit condition. Mr. Hewitt sends a specimen in flower, without locality. The whole of the little plant is usually red, leaves, flowers and fruit. The leaves are very fleshy. The lip appears to be quite entire ovate.

Platyclinis Bartoni, n. sp.

Pseudobulbs not seen. Leaf narrow lanceolate acuminate obtuse narrowed at the base, 7 inches long ¾ inch wide, keel prominent, ribs less prominent 6. Scape 12 inches, base 6½ inches nude, raceme lax, flowers inch apart. Bracts narrow lanceolate papery ⅕ inch long, spreading persistent. Pedicels with ovary a little shorter. Flowers apparently yellowish with a brown lip ¼ inch across. Sepals lanceolate acuminate acute. Petals nearly as long but little more than half as wide. Lip shorter than sepals, base narrow, side lobes fairly large lanceolate acute, excurved, midlobe much longer ovate acute, dilated towards the middle, margin towards apex denticulate, 2 elevated keels running from base and disappearing on the midlobe. Column hood long oblong three toothed at the truncate tip. Stelidia large rising as a margin to column from base, above triangular lanceolate with a broad base, tip acute, free from just below the stigma.

British New Guinea, (Major F. R. Barton No. 5).

This appears to be the first species of the genus found in New Guinea. It is rather remarkable for the long curved filament of the anther and longer rostellum than usual.

Bulbophyllum patens, Hook. fil.

A plant of this species was sent in a collection of orchids from Java by Mr. Beauclerk, and flowered in the Botanic Gardens, Singapore. The species has not hitherto been recorded from anywhere outside the pen-

ERRATA:—Page 129, for line 3 substitute—
B. lasianthum, Lindl.

insula and is not recorded by Mr. Smith among the Javanese orchids.

B. (§ Monantha parva) Scintilla, n. sp.

I met with a large plant of this strange orchid on a tree at Kukub, South Johore, in flower in April 1908. It is well known from the rocks on Penang Hill, and I have it also from Sumatra.

B. (§ *Monantha parva*) *Scintilla*, n. sp.

Rhizome slender wiry, pseudobulbs curved base prostrate, upper parts ascending $\frac{1}{5}$ inch long, leaf oblanceolate fleshy $\frac{1}{4}$ inch long. Scape very slender 1 inch long. Flower $\frac{3}{10}$ inch long. Sepals very narrow lanceolate acuminate bright orange. Upper one much narrower than the others. Petals very short linear orange darker at the tips. Lip linear acuminate fleshy deep pink nearly half as long as the sepals.

Sarawak: at Kuching (J. Hewitt).

A distinct little species resembling *B. catenarium*, Ridl. but with acuminate sepals, gibbous below and different pseudobulbs.

B. (§ Sestochilus) punctatum, n. sp.

Pseudobulbs conic 1 inch long, with fibres of broken up sheaths at the base. Leaf elliptic coriaceous subacute base slightly narrowed to petiole 5 inches long $1\frac{1}{2}$ inch wide, petiole 1 inch. Scape slender $3\frac{1}{2}$ inches long. Flower solitary, upper sepal ovate acuminate $\frac{3}{4}$ inch long $\frac{1}{2}$ inch wide yellowish with brown spots, laterals gibbous at the base narrower lanceolate linear acute pubescent yellow distally with a reddish tinge and red brown spots below. Petals lanceolate cuspidate nearly as long as the sepal, but narrower. Lip short oblong fleshy, base prolonged into 2 red processes, sides high elevated apparently purple with a pale broad groove between.

Sarawak: Matang (J. Hewitt).

There seem to be a number of these pretty Bulbophyllums in Sarawak, Kranzlin describes in Engler's Bot. Jahrb. 34. ii. 251 viz. *B. cryptophoranthoides, B. hymenochilum, B. scandens* all from Matang. This one is distinct in having pubescent lower sepals. It is allied to *B. insigne,* Ridl. of Borneo.

B. (§ Racemosae) perpusillum, n. sp.

A very small tufted plant, with minute cylindric pseudobulbs $\frac{1}{10}$ inch long crowded together, and subtended with papery lanceolate bracts. Leaf fleshy coriaceous oblanceolate obtuse, nearly $\frac{1}{2}$ inch long $\frac{1}{10}$ inch wide, narrowed into a petiole at the base, tip usually rounded with a minute mucro. Scapes slender as long as the leaves bearing one flower at the top. Bracts 2 the lowest lanceolate, the upper one narrower. Flower yellow less than $\frac{1}{10}$ inch long, pedicel short. Upper sepal lanceolate acuminate, laterals gibbous at base above lanceolate acuminate curved. Petals linear half as long. Lip broad, thin base oblong with two fleshy ridges enclosing a depression, lamina ovate subacute apparently white. Column with oblong stelidia truncate short. Anther rather broad, beak rounded fleshy.

Sarawak: Bidi (C. J. Brookes) Jan. 1908. Flowers yellow.

A very curious little species, forming minute tufts, with the flowers of the racemosae section but only one, on each.

B. (§ Racemosae) pumilio, n. sp.

Rhizome slender short, covered with papery sheaths, pseudobulbs cylindric $\frac{1}{10}$ inch long covered with a lanceolate papery sheath, nearly twice as long. Leaf coriaceous linear subacute 2 inches long, inch wide. Raceme slender 1-$\frac{1}{2}$ inch wide, enclosed at the base with a tubular sheath, with a lanceolate limb. Flowers remote white about 10. Bracts lanceolate acuminate about as long as the pedicel $\frac{1}{20}$ inch long. Sepals $\frac{1}{5}$ inch long, lanceolate acuminate, lower ones gibbous at the base. Petals lanceolate acute half as long. Lip with a narrow base limb elliptic lanceolate obtuse margins denticulate. Stelidia porrect oblong rounded at the tip rather large for the size of the column.

Sarawak: Bidi, Jan. 1908 (C. Brookes).

The number of *Bulbophylla* of this section seems endless. This small species differs from any other known to me in its linear leaves and denticulate tip.

Bulbophyllum Brookesii, **n. sp.**

Rhizome thick and woody with closely appressed subglobose pseudobulbs, with depressed tops, truncate rounded $\frac{1}{4}$ inch long. Leaf coriaceous elongate subspathulate apex rounded, base gradually narrowed to a thick petiole, blade 6 inches long $\frac{3}{4}$ inch wide petiole $1\frac{1}{2}$ inch long. Raceme 6 inches long slender erect glabrous, with several sheaths at the base. Flowers numerous, scattered from near the base upwards. Bracts linear acuminate $\frac{1}{10}$ inch long. Pedicels little longer. Sepals lanceolate subacute $\frac{1}{8}$ inch long. Petals very small not longer than the column ovate. Lip very small fleshy sides at the base and for more than half the length of the lip curved up, with a groove between apex ovate thick and fleshy. Column and its foot short. Stelidia short subulate.

Sarawak: at Bidi (C. J. Brookes).

This species has somewhat of the appearance of *B. puberulum,* Ridl. but is quite glabrous, and has curious closely approximated pseudobulbs of a cupshape.

Bulbophyllum sarcanthoides, **n. sp.**

Rhizome very short, pseudobulbs very small. Leaf succulent lorate drying black, falcate acute $1\frac{1}{2}$ inch long $\frac{1}{4}$ inch wide distichous. Racemes very dense $\frac{1}{5}$ inch long with lanceolate acuminate bracts, comose. Flowers yellow $\frac{1}{4}$ inch long. Sepals lanceolate caudate with a strong central midrib no lateral veins. Petals wider at the base lanceolate caudate, rather shorter. Lip half the length of the sepal base narrow, lateral lobes ovate curved obtuse, midlobe very narrow acuminate caudate centre elevated thickened. Column short and broad winged, filament distinct. Anther for the column large oblong rounded.

Johore: Sungei Tebrau, on trees over the river.

A very curious plant with the habit of a small *Saccolabium*, with flowers in upwards dilated racemes.

Dendrobium gramineum, n. sp.

Stems long very slender, branched about $\frac{1}{20}$ inch through flexuous, branches 6 or more inches long. Leaves linear lanceolate $\frac{1}{2}$-$1\frac{1}{2}$ inch long $\frac{1}{5}$ inch wide, acute bifid with one acuminate point much longer than the other, sheaths $\frac{1}{4}$ inch long ribbed and thickly nigrohirsute. Flowers solitary with several papery ovate bracts, at the base, peduncle slender $\frac{1}{4}$ inch long. Sepals $\frac{3}{10}$ inch long lanceolate threeveined. Mentum long straight parallel to the pedicel obtuse $\frac{1}{5}$ inch long. Petals narrow linear. Lip as long as the sepals base linear, lateral lobes triangular acute, short and broad. Midlobe spathulate with a narrow cloud and a rounded limb, three ridged and papillose. Column stelidia broad rounded.

Sarawak: Matang on trees (Ridley, Hewitt).

Allied to the terrestrial aquatic *D. conostalix,* Lindl. but an epiphyte branched with very different petals and lip.

Dendrobium Ardeni, n. sp.

Stems slender branched, pseudobulbs subcylindric slightly flattened olive green $1\frac{1}{2}$ inch long by $\frac{1}{4}$ inch wide remote. Leaves lanceolate linear 3-4 inches long $\frac{1}{4}$-$\frac{1}{2}$ inch wide dark green coriaceous, narrowed at the base subobtuse. Flowers in tufts from the axils of the leaf appearing singly or in pairs, as large as those of *D. Kelsalli.* Pedicel pale green $\frac{1}{4}$ inch long. Sepals oblong recurved subobtuse cream with faint purplish veins. Petals linear acute narrower. Mentum short broad conic curved, faintly marked with red veins. Lip as in *D. Kelsalli*, but, lateral lobes short rounded pink, midlobe with a distinct claw then dilated into a bilobed rounded limb, on the disc two thick fleshy large semi-elliptical cushions deep-purple, rest of the disc and claw violet pink, limb creamy yellow. Column lemon yellow.

Johore: Kukub estate, Tempayang River, (Fl. in H. B. S. May 22, 1908).

This resembles *D. Kelsalli* but differs in the rather rather longer recurved sepals, the short rounded lobes of the lip, with a distinct claw between the disc and the limb, instead of overlapping, and instead of three ridges running from the base of the lip to the base of the mid-lobe, there are two thick fleshy deep purple crimson half elliptic cushions with a groove between. The flowers are less than half an inch long.

D. (§ Pedilonum) Crabro, n. sp.

Stamens subcylindric dilated upwards, strongly grooved of about 6 internodes 2 to 4 inches long, and ¼ inch through when dry. Leaves elliptic obtuse 3 inches long 1 inch wide, slightly narrowed at the base. Flowers borne in the leafless stems on the upper nodes solitary on short ⅕ inch pedicels with an ovate bract. Peduncle slender 1 inch long pink. Sepals ovate ¼ inch long petals similar but shorter and more rounded at the tip. Mentum ½ inch long base narrowed then dilate at the base, like the body of a wasp. Lip ½ inch long, base narow linear then suddenly dilate into two oblong ovate rounded lobes ⅖ inch across when expanded, then narrowed linear ending in a rounded reniform limb. Between the lobes the veins are thickened into a callus. Column dilated widely. Anther conic blunt, apex thick. Stigma cordate large with a broad thick elevated margin.

Sarawak: Matang (June 07, Hewitt). Petals with a green tinge, the veins red. Lip and column white.

This is a fine Pedilonum remarkable for its curious mentum narrowed and dilated towards the tip and curved like the abdomen of wasp, and for the lip with its two broad side lobes about half way from the base and the broad fan-shaped terminal lobe.

D. (§ Pedilonum) multiflorum, n. sp.

Stems slender 18-24 inches tall $\frac{1}{4}$ inch through slightly flexuous strongly grooved, internodes 1 inch long. Leaves elliptic obtuse nearly sessile 3 inches long by 1 wide. Racemes terminal 2 to 4 inches long many flowered. Bracts narrow lanceolate small. Flowers large. Pedicel winged $\frac{1}{2}$ inch. Sepals elliptic lanceolate acute. Petals similar a little smaller. Mentum long curved half an inch long thick blunt. Lip spathulate, base linear centre thickened, limb broadly orbicular ovate 1 inch across distinctly nerved. Nerves at the base of the limb elevated into an undulating keel. Column rather tall oblong. Anther short and thick. Stigma narrow oblong with an elevated margin and two fleshy wings outside. Capsules $\frac{1}{2}$ inch long elliptic.

Sarawak: at Quop (March 1908). Petals and lip yellow. Sepals red outside, the colour more pronounced on the mentum.

The habit of *D. secundum,* but with very different flowers.

Dendrochilum spathulatum, n. sp.

Rhizome long much branched slender $\frac{1}{10}$ inch thick, yellow, pseudobulbs cylindric yellow and deeply grooved when dry 1 inch long $\frac{1}{10}$ inch through. Leaf elliptic lanceolate narrowed rather abruptly to the base apex obtuse 2 inches long $\frac{1}{2}$ inch wide. Racemes slender about 2 inches long floriferous to the base. Bracts ovate acute minute persistent papery half as long as the pedicels.

Flowers $\frac{1}{10}$ inch across. Sepals linear obtuse fleshy 3 nerved. Petals shorter. Lip less than half as long as the sepals narrow entire fleshy base oblong with two fleshy raised keel, apex subspathulate rounded thin. Column very short, upper margin oblong as long as the r est of the column, stelidia from near the anther base lanceolate acuminate apex subulate as long as the clinandrum margin. Capsule $\frac{1}{2}$ inch long and nearly as wide rounded triquetrous almost cone-shaped.

Pahang: on the Tahan River in fruit; Sumatra; Sungei Kelantan; Siak (Ridley).

Certainly near *D. aurantiacum*, Bl. but distinct in the very large oblong crest to the column, and spathulate lip. I believe the Pahang plant is identical with the Sumatran one though it is only in fruit.

D. intermedium, n. sp.

Stems long woody creeping $\frac{1}{10}$ inch through, pseudobulbs remote $1\frac{1}{2}$-3 inches apart, cylindric rather slender 1 inch long. Leaves coriaceous elliptic obtuse $1\frac{1}{2}$-2 inches long, by 1-$1\frac{1}{2}$ inch wide, petiole $\frac{1}{5}$ inch long. Racemes slender 4 inches long, 2 to 5 together close to a pseudobulb, with numerous lanceolate papery bracts at the base, floriferous to the base. Rachis black pubescent. Bracts (floral) minute ovate acute papery as long as the pedicels. Pedicels $\frac{1}{20}$ inch long. Flowers pale yellow very small. Sepals elliptic apices rounded. Petals narrower and shorter. Lip shorter than the sepal $\frac{1}{2}$ its length, linear oblong entire, with two large keels in the centre. Column rather small, stelidia linear acute erect longer than the column, back of clinandrium ovate.

Sarawak: Mt. Matang, June 1907 (Hewitt).

This species is allied to *D. aurantiacum*, Bl. of Java, and *D. brevilabratum*, Pfitzer collected at Baram by Hose. The foliage is quite different from the lanceolate leaves of the former, which it resembles in its nigro pubescent rachis that of *D. brevilabratum* being glabrous.

Eria eurostachys, n. sp.

Stems cylindric 8 inches tall covered with rather large loose sheaths strivate with oblique mouth, 1 inch or less long. Leaves numerous at the apex narrow lanceolate acuminate acute, narrowed to the base 4-6 inches long ½ inch wide. Racemes from upper axils very slender 4 or 5 inches long entirely ferruginous hairy, floriferous nearly to the base. Flowers very small numerous, red hairy. Bracts ovate acute feruginous hairy $\frac{1}{20}$ inch. Pedicel short and thick as long. Flowers to end of mentum ⅕ inch long. Upper sepal ovate acute cymbiform laterals ovate oblique, mentum long straight twice as long as the pedicel. Petals linear oblong obtuse shorter than the sepals. Lip very narrow spathulate, claw linear limb entire cordate obtuse. Column short very broad, anther flattened subquadrate retuse. Stigma elliptic large.

Sarawak: Mt. Matang (J. Hewitt) (June 1907).

A most curious plant with ferruginous spikes of small flowers, and leaves drying too of a rusty brown. It should I think be classed near *E. floribunda* from its habit, and form of stem but the hairiness and form of the flowers suggests an affinity with the Aeridostachya section.

E. tenuiflora, Ridl.

I can hardly separate a plant from Kuching from this Malay peninsula species. The Borneo plant has more acuminate sepals, and a rather wider more rhomboid lip.

E. Brookesii, n. sp.

Stems cylindric fleshy 4 inches long nearly ½ inch thick. Leaves lanceolate oblong acuminate acute narrowed into a petiole, nerves prominent, 9 inches long 1½ inch wide glabrous. Raceme dense, from below the foliage, 1½ inch long flowers numerous crowded, peduncle very short with ovate papery bracts. Floral bracts oblong lanceolate glabrous veined as long as the hairy pedicels

$\frac{1}{8}$ inch long. Sepal, dorsal ovate lanceolate cymbiform, laterals falcate acute mentum as long as the free portion all hairy, broad rounded at tip. Petals falcate lanceolate acute. Lip claw long linear narrow, lamina ovate obtuse obscurely trilobed, side lobes shorter than midlobe; two elevated nerves run from base of claw diverge on disc and meet again on the centre of midlobe where they are elevated into a fleshy mass and are here joined by the median nerve. Column short but stout, stelidia small. Anther broad thin. Pollinia pyriform.

Sarawak: Bidi March 08 (C. J. Brookes). Flowers pale almost fleshy color, midlobe of lip yellow.

Near *E. densa,* but with hairy flowers and no basal lobes to the lip. The specimen is poor.

Plocoglottis hirta, n. sp.

Stem over half an inch through, covered with long pubescent leaves lanceolate 15 inches long $2\frac{1}{2}$ inches wide acuminate narrowed at the base to the broad sheath hairy on both surfaces ribs 5. Scape axillary 3 foot tall hairy, at the base a few distant sheaths ribbed acuminate 1 inch long, raceme lengthening to about a foot. Bracts comose lanceolate acuminate caudate subulate hairy $1\text{-}\frac{1}{2}$ inch long. Pedicels hairy 1 inch long. Sepals and petals similar lanceolate caudate hairy outside $\frac{1}{2}$ inch long $\frac{1}{8}$ inch across at the base. Lip glabrous subquadrate narrowed a little at the base, apex with a long linear horn from each angle and a central one decurved at the tip. Towards the base of the lip a pocket is formed by the involution of a portion of the centre. Column short and very broad, clinandrum deep, no arms. Pollen masses 4 oblong ovoid.

Sarawak at Bidi (C. J. Brookes).

A very remarkable plant with apparently a tall leafy stem from the axil of which rises a tall slender scape ending in a gradually elongating raceme of hairy flowers.

The whole plant is very hairy. I have unfortunately no note of colour of flowers or height of the plant.

Geodorum pulchellum, n. sp.

Leafy stem with leaves little over 6 inches tall. Leaves 4 unequal, the largest elliptic undulate acute herbaceous dull dark green about 5 nerved 5 inches long, 2 inches wide. Racemes 2 to each leaf tuft 3 inches tall, peduncle 1-2 inches covered with loose lanceolate acute green sheaths, raceme nodding flowers about 8. Bracts lanceolate acuminate $\frac{1}{4}$ inch long. Pedicel as long. Sepals oblong lanceolate upper one narrower than the others $\frac{5}{8}$ inch long white. Petals wider oblong lanceolate as long white. Lip entire saccate, shortly spurred $\frac{1}{2}$ inch long apex rounded entire, base outside white, inside tinted purplish with 2 short calli or bosses, pustular dark red, apex of lip bright orange yellow. Column short, very broad and flat with no distinct wings, white with purple-madder streaks on the face and edging at base. Stigma large semi-ovate. Anther low, rounded flat truncate in front, pale yellow with a purple margin at the back and edges of cells. Clinandrum margin elevated ovate. Rostellum indistinct nearly entire. Pollinia elliptic.

Siam: Bangtaphan (Dr. Keith); Singgora (St. V. B. Down).

This charming little plant flowered in the Botanic Gardens Singapore in April 1908. Mr. Down from whom I received it states that it grows under bushes in sandy spots.

Taeniophyllum gracillimum, n. sp.

Epiphytic, stem $\frac{1}{10}$ inch long, roots elongate, very narrowly linear obtuse 3 to 5 inches long $\frac{1}{20}$ inch wide. Scape very slender $1\frac{1}{2}$ inch long, base nude, raceme very short, rachis slightly thickened. Bracts minute ovate acute. Pedicel and ovary longer. Perianth white $\frac{1}{10}$ inch long. Sepals lanceolate obtuse. Petals elliptic rather wider. Lip entire triangular ovate obtuse much larger than the petals. Spur nearly as long as the pedicel, pendulous clubbed. Column short. Anther skull-shaped. Pollinia 4 hemispheric, pedicel slender terete disc very long lanceolate acute, posticous end rounded. Rostellum elongate broad lanceolate.

Johore: Sungei Tebrau (March 1907), Tempayan River; Selangor: Petaling Woods.

I have two or three times come across this little orchid in the woods fallen from the tops of the higher trees, but never was fortunate enough to find any trace of flowers till I obtained one on a plant collected in the woods bordering the Tebrau River in Southern Johore. The single flower obtained is very small and delicate but I think I have made out its structure completely. The plant seems to be intermediate between *Saccolabium* and *Taeniophyllum.* The short stem, slender inflorescence with persistent distichous bracts and flowers appearing singly, and the pollen masses divided completely, are characters of *Taeniophyllum,* while the disc and pedicel of the pollinia resemble those of a *Saccolabium.* Since writing the above I came across several specimens in the Kukub forests Southern Johore, fallen from lofty trees in flower in April.

Dendrocolla minima, n. sp.

Stem ¼ inch long covered with oblong obtuse fleshy leaves ½ inch long by ½ inch wide or less. Racemes several ½ inch long, peduncles very short raceme lengthening to nearly half an inch with crowded ovate acute recurved bracts. Flowers very small ⅛ inch long, apparently pink. Upper sepal ovate, laterals ovate subtriangular larger. Petals shorter oblong. Lip with 2 appressed upper lobes linear oblong, below a spur as long as the short peduncle elongate scrotiform rounded, midlobe so short as to be concealed beneath the two side-lobes. Column straight rather tall, no stelidia, rostellum ovate. Anther skull-shaped truncate in front with a short tooth yellow.

Sarawak: Kuching (Hewitt).

A very odd little thing. The habit is quite that of a *Dendrocolla,* but the lip is very curious, the side lobes meet together in the middle line leaving only a slit as an entrance to the spur; the main part of these is depressed so as to form a flat disc, beneath is a minute midlobe. The spur is more like that of a Saccolabium.

Saccolabium laxum, n. sp.

Apparently a tall slender plant, upper part of stem $\frac{1}{4}$ inch through. Leaves lorate blunt unequally bilobed, coriaceous, 6 inches long $\frac{3}{4}$ inch wide. Panicle 18 inches long lax diffuse branches 4-6 inches long. Flowers distant. Bracts fleshy triangular. Flowers numerous $\frac{3}{10}$ inch long. Sepals oblong obtuse upper one slightly hooded. Petals smaller linear oblong shorter and only half as wide, greenish inside with a dull brown tinge. Lip white inside lobes triangular lanceolate, midlobe subcordate with a narrow base, fleshy blunt with a fleshy central keel running down into the spur and forming a partition, between the lateral lobes it is pubescent, but in the spur and on the midlobe it is glabrous. Spur $\frac{1}{5}$ inch long thick porrect, curved forwards parallel to the midlobe or nearly so, callus on the back of the spur in the mouth, a raised tongue-shaped ridge fleshy grooved down the centre and pubescent at the lower end. Column short and broad, with two short linear pubescent stelidia, at the points where the lip is adnate to the column. Anther broad front margin, broad truncate, top of anther rounded grooved. Pollinia elliptic small, grooved transversely below the middle, pedicel triangular short, disc large fleshy saddle-shaped deeply bifid. Rostellar arms short blunt widely divaricate.

Sarawak: Matang, June 1907 (J. Hewitt).

This is one of the *Sarcanthus* set of this genus, and seems very distinct. The abrupt forward curve of the thick spur reminds of the form of the lip in *S. penangianum, miserum,* etc. The form of the column and the curious pollinia recalls that of *S. rostellatus,* Ridl.

S. pinifolium, n. sp.

A dwarf plant 4 inches tall, internodes very short. Leaves crowded erect, sheaths strongly grooved $\frac{1}{5}$ inch long, lamina terete acute $1\frac{1}{2}$ inch long $\frac{1}{8}$ inch wide. Raceme slender $\frac{1}{2}$ an inch long 2 or 3 flowered. Bracts very small ovate. Flowers inch long from tip of sepal to spur tip. Sepals, upper one ovate, blunt, laterals broader ovate curved, strongly 3 nerved. Petals narrower and shorter linear oblong, slightly dilated towards the tip dull green with red centre. Lip shorter than sepals bright yellow spur short scrotiform, lateral lobes liner subacute erect small, midlobe has tall acuminate, basal lobes rounded small, callus in spurmouth a small short ridge, on back of spur a short cylindric decurved process. Column rather tall. Anther broad, beak large ovate triangular, pollinia not seen. Rostellar lobes very short.
Sarawak: Bidi (C. Brookes, comm. J. Hewitt).

S. strongyloides, n. sp.

Stem elongate $\frac{1}{10}$ inch through. Leaves terete recurved 4-5 inches long $\frac{1}{8}$ inch thick obtuse, sheaths 1 inch long ribbed and closely transversely wrinkled. Raceme 5 inches long, flowers distant on pedicels $\frac{1}{4}$ inch long. Bracts very small ovate acute. Sepals oblong ovate broad and short, quite blunt. Petals broader almost orbicular ovate. All yellow with red brown centre $\frac{3}{20}$ inch long. Lip pale violet, lateral lobes linear obtuse short apex spoon-shaped mid-lobe hastate, narrow, basal lobes broad rounded larger than the side-lobes, tip narrow obtuse crenulate, thin, spur short thick blunt slightly curved forward, tip retuse. In the centre of the mid-lobe near the mouth of the spur is a depression edged by an elevated V shaped ridge in front, in the centre of the depression a thin keel running down to form the spur partition which is incomplete. Callus on the back of the spur curved narrow, grooved, apex pubescent, mouth of the spur pubescent. Column short, foot prolonged into the spur in a short process. Anther broad with a narrow straight margin. Pollinia semiorbicular, with a very broad thin pedicel subquadrate with an acute tip, disc fleshy apparently orange colored, saddle-shaped, back rounded; rostellar lobes broad deflexed quadrate.

Sarawak: Kuching Feb. 1908 (J. E. Lewis, comm. J. Hewitt).

Allied to *S. Machadonis,* Ridl. but with broader leaves, rounded broad petals and sepals and a different callus.

Podochilus rupicola, n. sp.

Tall stout tufted plant with long stems 2 feet long. Leaves elliptic 2 inches long ½ inch wide slightly narrowed at base obtuse at tip. Inflorescence 6-8 inches long pendulous, raceme 1½-4 inches long slender. Bracts small lanceolate deflexed, acute persistent. Flowers $\frac{1}{10}$ inch long. Upper sepal ovate small, laterals large triangular. Petals small oblong, mentum gibbous wide. Lip oblong apex bilobed lobes rounded, base rounded, with the horse-shoe-shaped callus at the base and 2 parallel ridges on the limb. Fruit ½ inch long fusiform.

Borneo, Sarawak: on rocks at Bidi (Ridley 11792); Batu (Hewitt).

Leucolena ornata, Ridl.

I put this curious saprophytic orchid into the section Epidendreae of Orchids with some amount of doubt as there was nothing at all which shewed any affinity to the plant in the section. Its appearance certainly suggested that its affinities lay with the Neotticae section among which saprophytes are not at all uncommon. But in the plants obtained in Bukit Sadanen in Malacca, I found what appeared to be a distinct disc to the pollen masses and the anther is not at all like that of most

Neottieae. I have recently (April 17, 1907) rediscovered the plant in Singapore, in dense forests by the side of a stream at a spot formerly known as Stagmount, and have thus had an opportunity of examining the plant again. The Singapore plant differs from the ones found in Malacca in having the lip nearly quadrate with a central tooth and hardly distinctly bilobed, the limb white and only the claw violet. The rostellum very small in the Malacca plant seems quite absent and the curved sausage-shaped pale flesh-colored pollinia have no trace of any disc at all. This plant was evidently destined to be self-fertilised as the pollinia slip into the stigma with the greatest ease. The filament so long in the Malacca plant is quite short in the Singapore one. For the present it may be preferable to consider the Singapore plant as a variety, *Singaporensis* of the species.

Now in the light on the plant shown by this variety, we can more easily determine its affinity, and that is I think with the genus *Gastrodia,* to which it is allied in its stout rhizome, its connate perianth, (for the whole of the perianth is connate at the base, though divided into two lips, one consisting of the sepal and two petals, the other of the two lower sepals), and the form of the pollinia. *Gastrodia* differs in the almost completely tubular flower, and the very short stelidia.

Leucolena ornata var. *Singaporensis.*

Lip subquadrate with a median tooth hardly bilobed, limb white, base violet. Rostellum quite absent. Pollinia free 4 with no disc. Filament of anther much shorter.

Damp sandy woods on a stream bank at Stagmount, Singapore, flowering in April 1907.

ZINGIBERACEAE.

Geocharis, n. gen.

Creeping herbs with rather slender rhizomes throwing up leafy stems and inflorescences at intervals. Leaves elliptic to lanceolate shortly petioled. Inflorescence on a tall or short peduncle covered with long green sheaths, raceme erect many flowered. Flowers orange or red very shortly pedicelled. Bracts very small spathaceous. Calyx tubular trifid, lobes caudate ciliate. Petals as long somewhat similar. Lip deeply bifid into two narrowed linear lobes base adnate to the corolla. Stamen filament broader than the anther involute forming a tube with the lip, with two short subulate staminodes at the upper angle. Anther broad oblong with an entire ovate appendage. Style stout. Stigma obcuneate curved subbilobed. Stylodes annulate lobed.

Johore, Sumatra and Borneo.

This genus though based on a plant obtained in Johore, I think must include one at least and probably both of the plants described by Schuman under the section *Geocharis* of *Alpinia* vis. *A. macrostemon,* Schumann of Sumatra, and probably *Alpinia decurva,* Ridley a New Guinea plant. I have therefore adopted Schumann's sectional names as a generic names for these plants. Schumann who included a great many and very varied plants in the genus *Alpinia,* noted the fact that both the above mentioned plants resembled the genus *Riedelia,* and it is possible that *A. decurva,* Ridl. may belong to that Papuan genus. I cannot see any connection with or resemblance to the plants of the genus *Geostachys,* as suggested by him.

G. aurantiaca, n. sp.

Rhizome ¼ inch thick, leafy stems about 2 feet tall swollen at the base, sheaths rugose closely brown hairy blade a foot long 4½ inches wide elliptic glabrous deep green shining above, paler beneath, petiole ½ inch long brown hairy. Peduncle of inflorescence 1 inch long, covered with long loose deep green rugose sheaths. Raceme 5 inches long, flowers crowded very shortly stalked numerous. Bracts minute spathaceous. Calyx tubular 3 lobed, lobes caudate hairy 1¼ inch long, glabrous except at the cuspidate tip, orange. Corolla lobes equally long linear oblong orange. Lip as long as the anther, deeply split into two linear lobes for nearly all its length lobes obtuse crimson with a yellow edge. Anther oblong pale yellowish with a small ovate crest, filament broad, edges involute towards the lip and forming a tube with it, pinkish yellow, with two subulate points at the top near the anther. Stylodes forming a shortly 3 lobed pale violet ring. Style stout, stigma obcuneate, upper lip longer than the lower and incurved. Base of filament in the tube with a large tuft of silky hairs. Ovules numerous.

Johore: In thick low swampy forest at Kukub. In bud April 1908. Borneo, Sarawak: Bidi (Hewitt Aug. 1907).

This remarkable plant seems most nearly allied to the genus *Riedelia* which is confined to the Papuasian region of the Archipelago.

The separate inflorescence and the corolla-like sepals are very remarkable points of difference, and the broad involuted filament forming a tube with the lip though free from it is very curious. I only found one plant of it in bud.

The woods in which this plant occurs are remarkable in many ways. The soil consists of nothing but dead and rotten timber and vegetable debris, for a very considerable depth, below and in other parts of the estate there is a great deal of a very greasy stiff clay. The presence of recognisable fruits of the Nipa palm show that this part of the coast was marine at no very distant period. The mangrove swamps and tidal streams seem to have receded and been covered up with a dense wet forest, containing a somewhat peculiar flora. The trees are of very large size, *Cumpasia Malaccensis* being very abundant. The absence of *Nephrodiums Lastreas* and such ferns is very striking, and indeed the terrestrial ferns common in the clayey woods of Singapore and the greater part of the Singapore flora is not represented, except in the matter of epiphytes. *Calanthe veratrifolia.* A very fine form with unusually grey leaves, *Lepidogyne longifolia* otherwise only known from Penara Bukit in Penang, *Cystorchis purpurascens, Plocoglottis javanica, Nephelaphyllum pulchrum* were among the terrestrial orchids. In some spots the preponderance of Monocotyledons over Dicotyledons was very marked. Thus some parts of the forests consisted of *Phrynium malaccense* and *Ph. hirtum, Donax grandis, Alpinia melanocarpa, Plagiostachys albiflora* n. sp., with several other *Zingiberaceae* not in flower. *Zalacca conferta* and *Wallichiana;* one or two species of *Daemonorops, Calamus pencillatus* and several species of *Pinanga,* and *Nenga Wendlandiana, Oncosperma tigillaria* and *Pholidocarpus Kingianus* a few tree ferns, and some large dicotyledonous trees, formed the rest of the flora. *Schismatoglottis Wallichii* often in great abundance, *Alocasia longiloba, Homalomena rostrata* represent the aroids.

The immense mass of vegetable debris forming the soil to a considerable depth, without any apparent mixture of mineral matter, not a pebble or fragment of stone being visible over the whole of this area, suggests that the tertiary coal deposits of Borneo and Labuan have had some such origin as this.

G. rubra, n. sp.

Rhizome slender with strong rather stout roots. Stem slender 14 inches long ⅙ inch through. Leaves narrow lanceolate caudate tapering gradually at the base to a short petiole, glabrous above, pubescent on the back especially on the mid-rib 9 inches long 1⅛ inch wide, ligule oblong rounded entire, sheaths ribbed with transverse ribs. Raceme 3-6 inches long erect from the rhizome, on a short peduncle 1-1½ inch long covered with lax sheaths. Flowers red, on slender erect pedicels 1 inch long. Bracts very small ovate pubescent. Calyx ¼ inch long with three triangular caudate lobes. Corolla tube but little longer, lobes linear oblong obtuse slightly pubescent and hooded at the tip. Lip deeply bifid into two narrow linear blunt lobes for half its length basal portion linear with a strong median keel, free from the filament except near the base. Anther oblong curved, with the cells slightly diverging at the tip, appendage very short rounded ovate, filament below the anther for some way linear flat fleshy, then winged widely with the staminodes in the form of two short triangular subulate processes. Style and stigma about as long as to the tip of the appendage.

Borneo, Sarawak: at Quop (Hewitt, March 1908). Flowers red.

This species differs from the preceding in its much smaller size, short racemes of long pedicelled flowers, and colour. The wings of the filaments, evidently the attached staminodes do not reach as high in this species as in the other, where they are adnate to the anther. The lip is not split so far down and is free for a longer distance.

Alpinia vittata, Hort. Bull. Nicholson Gard. Dict. 54. pl. 63. *Costus Zebrinus,* Hort.

Stems rather slender about 6 feet tall, leafy. Leaves lanceolate acuminate glabrous narrowed at the base not petioled, fifteen inches long and three inches across, green striped longitudinally with white, ligule short entire truncate edges ciliate, pink. Raceme terminal many flowered, 3 inches long rather lax, rachis white. Bracts about seven not imbricate, elliptic rounded at the top hardly narrowed at the base, glabrous pink half an inch long and wide, shortly mucronate, with a scarious edge. Flowers 1 to each bract white. Ovary glabrous obovoid $\frac{1}{4}$ inch long polished. Calyx tubular $\frac{3}{4}$ inch long, shortly split on one side, with three short teeth on the other. Corolla tube hardly longer than the calyx lobes oblong half an inch long, truncate hooded not expanding, all white. Lip as long oblong fleshy slightly tapering to the blunt tip, concave with a median depressed line quite entire except that occasionally there is a short tooth on one side. Filament of stamen adnate below the anther to the lip and forming a tube with it. Anther cells oblong white narrow. Connective very thick fleshy ending above in an irregularly dentate thick appendage. Style shorter than connective. Stigma thick and wide with a transverse slit. Stylodes forming a complete circle with numerous vertical grooves.

New Ireland (Micholitz).

This plant has long been in cultivation for its ornamental foliage. I saw it in Ceylon Botanic Gardens in 1888, and it appears to have been introduced before that. It was named *Castus zebrinus* in Ceylon. Probably *Alpinia albolineata,* Williams Cat. 1880 is the same thing. The flowers do not appear to have ever been described nor has any proper description of the plant ever been published. It is only mentioned in Schumann's v. *Scitamineae* in the P*flanzenreich*. It is best I think to refer it to the genus *Alpinia* though it differs from typical species of that genus in the entire lip of the same shape as the corolla lobes but more fleshy, and the prolongation of the very thick connective into a crest behind the anther, and the lip connate with the filament up to the anther.

A. grandiceps, n. sp.

A stout plant, stem over ¼ inch through. Leaves oblong lanceolate caudate acuminate, base long acuminate into a distinct petiole, blade 30 inches long, petiole 4 inches long subterete, width of blade 3 inches finely appressed pubescent on both surfaces, petiole pubescent, ligule oblong 3 inches long hairy on the edge, sheath pubescent. Capitulum subterminal 4 inches through nodding, outer bracts lanceolate acuminate papery 4 inches long, ribbed pubescent, edges silky hairy, ovate.

Floral bracts tubular bilobed, lobes ovate triangular, strongly ribbed pubescent, containing 5 flowers, inner ones contained in similar but smaller bracteoles. Calyx broad tubular 3 lobed, lobes ovate subobtuse, half an inch long apparently red. Corolla tube hardly longer, lobes broadly oblong keeled, upper one hooded yellow. Lip rather longer cymbiform edge crisped and curled, fleshy "veined with red brown below the throat." Stamen rather short, filament broad linear, anther lobes thick and fleshy unappendaged. Fruit capitulum very large, six inches through. Capsule glabrous hairy an inch long, crowned with the persistent calyx tube.

Sarawak: Kuching (Hewitt).

This fine plant is closely allied to *Alpinia capitellata,* Jack. and *A. javanica,* Bl. but a very much larger plant.

Zingiber longipedunculatum, n. sp.

Stem stout. Leaves lanceolate acuminate caudate narrowed to the base, widest about the middle, slightly pubescent at the base otherwise glabrous 12 inches long 2 inches wide, ligule rounded $\frac{1}{5}$ inch long pubescent, sheath 4 inches long pubescent. Scape peduncle 12 inches long stout covered with oblong truncate sheaths tubular at the base 2 inches long, about 5. Spike cylindric acuminate, base not narrowed, 6 inches long 1 inch through. Bracts ovate obtuse with a scarious edge, pubescent, I inch long $\frac{1}{2}$ inch wide. Corolla tube thick, lobes lanceolate acuminate acute $\frac{1}{2}$ inch long. Lip broad. Stamen hardly longer than corolla. Anther thick, appendage, curved narrowed to a long point. Style stout, stigma broad flattened triangular with long hairs on the edge.

Sarawak (J. Hewitt).

Z. chryseum, n. sp.

Stems tufted about 6 feet tall stout. Leaves oblong lanceolate caudate dark green paler beneath glabrous, base rounded broad, sessile, 18 inches long, 3¾ to 4 inches wide, ligule very short rounded entire. Flower spikes cylindric acuminate, 7 inches long on a peduncle of the same length covered with loose sheaths, all bright lemon yellow. Bracts ¾ to½ an inch across, rounded glabrous. Inner bracts oblong acute 2 inches long. Calyx spathaceous entire, mouth obliquely elliptic 1 inch long. Corolla tube 2 inches long, lobes lanceolate acuminate over an inch long creamy white. Lip trilobed, side lobes erect rounded, mid-lobe oblong obtuse entire, the same colour as the petals and nearly an inch long. Anther an inch long with the long curved appendage.

Singapore: Stagmount, in thick woods. In flower April 1908.

This superb species was certainly quite a surprise. I had many times explored the Stagmount woods, but had never came across this plant although I had been several times close to where this time I discovered it. It belongs to the same group as *Z. gracile,* Jack. and *Z. Griffithii,* but is very distinct in its brilliant yellow spikes, those of all the others of this group being pinkish red. It is much larger in all its parts than any other species of this section here except *Z. puberula,* Ridl. which rivals it in height of stems at least. In flower spike and flower this plant is bigger than any of this section. Its deep green shining leaves and the numerous bright yellow spikes make it the most attractive of its group.

Plagiostachys albiflora, n. sp.

A tufted plant about six feet tall. Stems several rather swollen at th ebase and reddish, ½ an inch through. Leaves lanceolate caudate narrowed at the base to the petiole, 13 inches long 3 inches wide, glabrous, petiole 2 inches long, ligule ¼ inch long deeply cleft into two rounded lobes. Spikes from near the base of the stems oblong obtuse, solitary or three together 2 inches long, 1½ inch thick. Flowers densely crowded. Bracts oblong pectinate, as long as the calyx tube pink at the base, brown above. Calyx lobes unequal acute ovate very thick and fleshy. Petals lanceolate acute, the upper one hooded white tipped with pink. Lip obovate hairy at the base apex bifid with two short points, bright yellow with horizontal red streaks running from the edges inwards towards the centre. Stamen white, anther broad pubescent at the base, filaments broad. Staminodia not visible. Stylodes as in *Pl. lateralis* but with several distinct lobes. Fruit elliptic obovate obscurely triquetrous, apex flat depressed with a circular scar of the perianth, dull red pulpy at first ½ inch long, pericarp becoming eventually leathery, 3 celled. Seeds 12 very small ⅛ inch long black ovate smooth.

Johore: Dense wet woods at Kukub. In flower April 1908.

Altogether smaller than *Pl. lateralis*, Ridl. with white flowers, and a differently shaped lip yellow marked with red. The inflorescence is lower down on the stem and quite near the base.

PALMAE.

Plectocomia minor, n. sp.

Leaf as sent 4 feet long, petiole 8 inches, flagellum 2 feet, sheath with a few small thorns on the edge, thorns acicular ⅛ inch long, petiole with a few distant short thorns, back rounded channelled above; leaflets elliptic lanceolate in threes below in alternate pairs above, base narowed subpetioluled, apex with a long slender point, many nerved, no distinct mid-nerve, 4-6 inches long 2 inches across filiform point 3 inches long or less, rachis with distant solitary hooks, flagellum with clusters of hooks 1 inch apart. Fruit spikes 2 feet long. Bracts oblong apex blunt 2 inches long 1½ inch wide. Rachis pubescent. Fruit 3-4 in a bract as large as in *P. elongata*. Bracteole triangular lanceolate. Pedicel stout angled distinct. Sepals large ovate obtuse. Petals narrow lanceolate smaller. Fruit subglobose long-beaked, scales dark brown longer than broad acute, lanceolate hairy on edges and tip, tip hairs elongate up-turned.

Sarawak: Santubong (Hewitt).

A remarkably small species for this genus of gigantic rattans.

Ceratolobus discolor, Becc.

Mr. Hewitt sends the termination of a stem with spathe and spadix of what appears to be this species. The stem is little armed. The bud surrounded by a dry brown sheath lanceolate over a foot long and 2 inches wide, acuminate. The young leaf has a stout flagellum with hooks in threes, and there are two flagella one stout bearing one or two abortive leaflets at the base, the other then slender and without leaflets. Spathe 18 inches long lanceolate ending in two long stiff points, smooth brown about 4 inches across. Spadix 9 inches much branched with slender branches and distant flowers. Spathels small dilate upwards with a short lanceolate limb. Calyx saucer-shaped with three short points. Petals ovate stiff connate at base, large. Ovary covered with brown glistening scales.

Sarawak: Batu (Hewitt). This plant hiterto has only been known from a leaf obtained at Kuching. The flowers have not previously been described.

455

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